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MOTOR AGE

HORAN, DAWSON, GELNAW, ATLANTA STARS

ATLANTA, GA., Nov. 7 — The final speedway meet of the year, so far as Atlanta is concerned, came to an end this afternoon when Joe Horan in a Lozier six-cylinder won the 250-mile class D free-for-all, another triumph for the stock car over the specially-designed racers. In performing this feat Horan established a new American record for the distance, his 3:26:15 beating the old mark of 4:38:57.4 made a year ago at Indianapolis by a Buick. This race was the only one of the meeting which developed any big records, but notwithstanding this, the sport was most interesting because of the large fields contesting and the close finishes. The meeting opened last Thursday and for 2 days the speed kings reigned supreme. Saturday's program, however, was upset by a heavy storm which forced a postponement until today. No attempt was made this afternoon to run off any of the short distance events, the time being devoted entirely to the running of the long distance grind which Horan won. In all three long distance events contested at this meet, the finishes were close, indeed, for such affairs. It was particularly exciting last Thursday in the Coca-Cola trophy race at 100 miles, which fell to Gelnaw in the Falcar. For miles and miles Dawson in the Marmon apparently had the race clinched, but as he was given the green flag for his final lap he was forced to make a stop at the pit because the driveshaft in the right half of the rear axle had twisted off at the outer end. At this time Dawson was more than 6 minutes ahead of Gelnaw, but the latter improved his opportunity and while the Marmon man was making his repairs went on and won handily with Knight in a Westcott second. Gelnaw averaged 69.5 miles an hour.

Although Dawson was beaten by so narrow a margin in the Coca-Cola he turned the tables the following day by beating Mulford in the Lozier four by a little more than 3 seconds in the 200-mile race for 451-600-class cars. This remarkably close finish reminds one of Dawson's experience in the July meeting at Indianapolis, when he was beaten by 5 seconds in the Remy trophy race by Burman and the following day won the Cobe cup from the same man by 2 seconds margin.

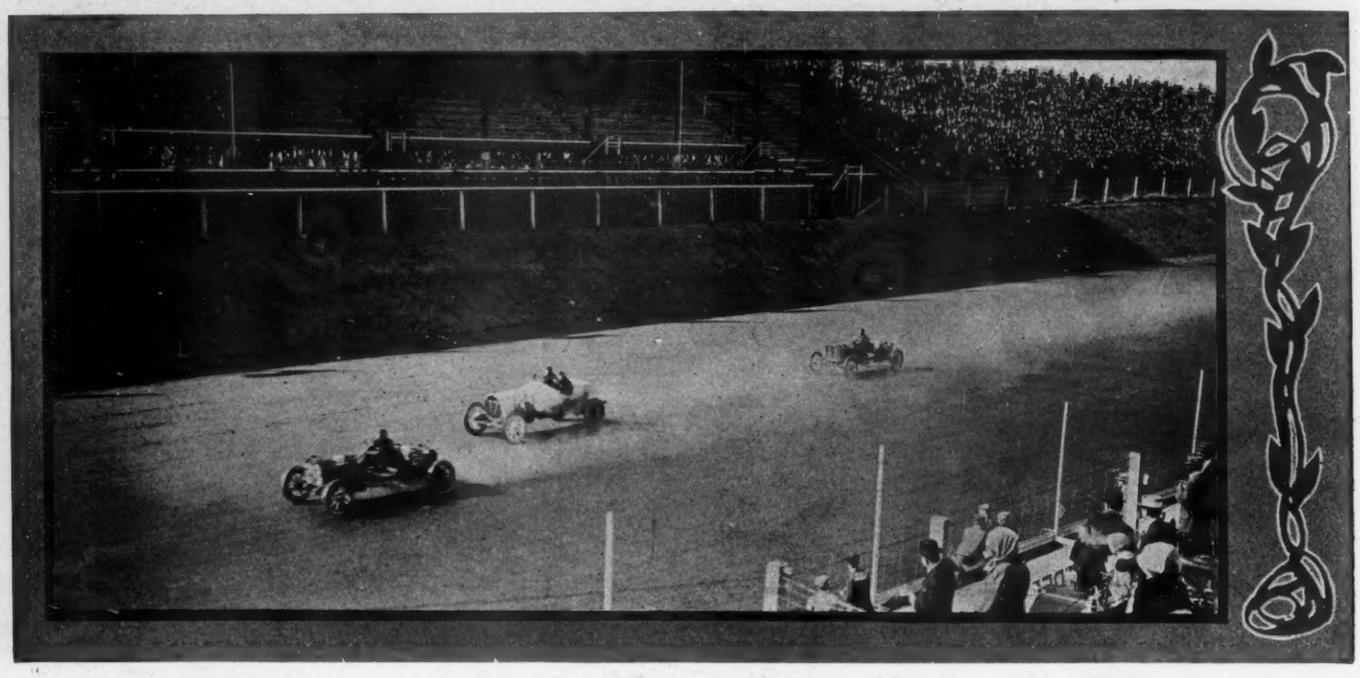
The shorter distance races produced good sport. The first day Bragg in the Fiat 90 won the mile time trial and honors also went to Witt in the E-M-F, Dawson in the Marmon, Stoddard in the Fiat, Burman in the Marquette-Buick and Mulford in the Lozier. On Friday Witt in the E-M-F again won his class, Burman took the 10-mile free-for-all in the Marquette-Buick, and also the 20-mile free-for-all in the same car. Dawson in the Marmon picked up two class events, while Stoddard, this time in a Simplex, won the amateur free-for-all very easily.

HORAN, WINNER OF 250-MILE RACE

GELNAW, FALCAR, COCA-COLA CUP WINNER

DAWSON, MARMON, 200-MILE-RACE WINNER

GELNAW IN FALCAR CAPTURES COCA-COLA CUP



DAWSON LEADING BASLE, POPE-HARTFORD, AND HEINEMANN, MARMON, IN CITY OF ATLANTA RACE

ATLANTA, GA., Nov. 5—In spite of the cold weather which has infested the southern states and the stinging breezes that swept across the speedway here on the opening day, Thursday, the racing for the first 2 days proved of the most interesting type from a competition point of view. It is true speedway records were not broken in every class, but two or three new marks were hung up and in several events, when it seemed certain that old marks would be shattered, the unexpected accident stepped in and robbed the management of the lower marks it had waited for. On the first day the weather was cool, but on the second day it warmed up. On the third day—Saturday—a constant drizzle, which started at 9, increased until at 11 everything was water-soaked and the Saturday events were postponed until Monday. This postponement was not accomplished without great difficulty, as many of the cars wanted to get to Savannah to practice for the grand prize events a week hence. It was finally agreed that all would wait.

In all there were twelve short distance races, one attempt at new time trials for track records, one handicap and three long-distance races, one of 100 miles, one of 200 miles, and one of 250 miles. The stock car events brought out the keenest competition, and it is notable that the genuine stock cars stood up better than the cars that are not stock, but are special creations, made for speed purposes only. A pleasing feature of the meet was the entire absence of accidents, excepting the regrettable Livingstone affair before the meet opened. The track was in good condition, being well oiled and only slippery at one turn. Since the spring meet of this year the turns have beeen widened 15 feet and a double set of posts inserted in the low guard fence at each side of the track, in order to prevent a car jumping off the track in case of an accident. The value of this fence was demonstrated in the Livingstone case, in which the car remained on the course.

The ball was set rolling on Thursday morning, with the onslaughts on the mile mark. Caleb Bragg, driving the Fiat 90, carried off premier honors, negotiating the distance in :41.10, or a speed of 87.5 miles per hour. Burman, in the Marquette-Buick, model 100, made the distance in :42.95. An Abbott made it in :55.60.

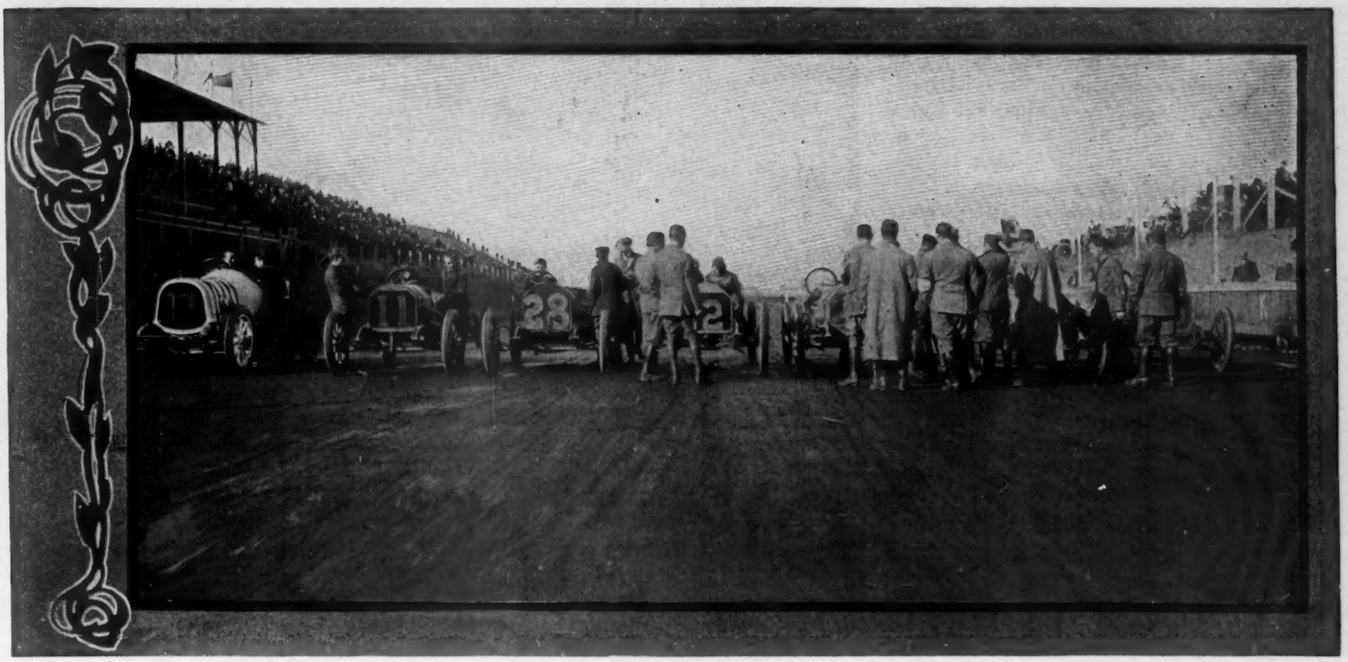
BURMAN, WINNER OF FREE-FOR-ALL

In the stock car class, 161-230 cubic inches, the E-M-F No. 32, driven by F. A. Witt, carried off the honors in both races in this division. On the opening day, at 12 miles, it established a new class record of 11:05, being a pace of 64.9 miles per hour. It was hotly pursued by an Abbot-

STOCK CHASSIS CARS, CLASS B, DIVISION 5, 451 TO 600 CUBIC INCHES PISTON DISPLACEMENT,

No.	Car	Driver	No. Cyls.	Bore	Stroke	10 Miles	20 Miles	30 Miles	40 Miles	50 Miles
28	Marmon	Dawson	4	4½	5	8:16	18:19	26:20	34:17	42:23
5	Lozier	Mulford	4	5⅝	6	8:12	18:10	26:09	34:05	42:05
6	Lozier	Horan	6	4½	5½	8:13	18:15	26:17	34:15	42:23
12	Falcar	Gelnaw	4	4⅞	5¼	9:11	19:56	28:30	37:16	45:53
14	Falcar	Hughes	4	4⅞	5¼	9:22	20:33	29:42	38:50	47:56
36	Simplex 50	Matson	4	5⅝	5⅝	8:13	18:24	26:33	34:41	42:53
23	McFarlan	Clemens	6	3⅝	3 31-32	9:40	21:08	30:32	39:56	49:22
18	Cole	Endicott	4	4½	4½	9:43	21:07	30:30	40:05	50:48
11	Marmon	Heinemann	4	4½	5	8:17	18:31	26:48	34:58	43:45
24	McFarlan	Adams	6	3⅝	3 31-32	9:43	21:09	30:31	39:56	.....
17	Pope-Hartford	Basle	4	4⅝	5½	8:25	18:39	Broken valve and piston		

DAWSON IN MARMON TAKES DOUBLE CENTURY



DRAMATIC INCIDENT—RACE IS HELD AND OFFICIALS BARE HEADS WHILE LIVINGSTONE FUNERAL IS TAKING PLACE

BRAGG, MILE TIME TRIAL WINNER

Detroit, No. 37, driven by Montague Roberts, whose figure of 11:09 was but 4 seconds back of the leader. Third place went to another E-M-F, and fourth position to an Abbott-Detroit. It was interesting to watch the duel between the E-M-F and Abbott-Detroit in this event. On the first lap the Abbott led both E-M-F's past the grand stand; in the second lap the E-M-F took the lead and held it by 1 second; the two contestants were side by side in the third lap; in the fourth they raced neck and neck; in the fifth circuit the E-M-F opened a space between them which was widened in the sixth circuit. A Firestone-Columbus, a Chalmers 30, and a third Abbott-Detroit were also contestants in this event.

On the second day of the meet this same group of cars met in a 10-mile event which was a repetition of the first one. The E-M-F won in 9:12, or at 65.2 miles per hour, setting a still higher record for the class for speedway work. Its running mate, No. 1, was eliminated just before this race by the flange on the intake manifold, where the carbureter attaches, breaking off. The No. 37 Abbott-Detroit was second, 6 seconds back of the leader, and another Abbott-Detroit was third, 7 seconds back. These two events completed the contest in this division.

In the 231-300 cubic inch class for stock cars there were two competitions—one the first day at 10 miles, and one the second day at 12 miles. Both were won by the same car, No. 25 Marmon, driven by Joe Dawson, and in each event the average was over 70 miles per hour. Dawson covered the 10 miles in 8:34, or at 70 miles per hour; and on the second day he negotiated the 12 miles in 10:15, or at 70.2 miles per hour. The first day's race brought out six contestants, two Marmons, three Falcars and a Parry. Marmons finished first and second, with Gelnaw in a Fal, No. 12, a close third but 9 seconds behind Dawson. The first lap was a hot struggle among Dawson and Heinemann in the Marmons and Gelnaw in the Falcar. The other two Fals and the Parry were over an eighth of a mile back. Gelnaw got the lead at the starter's pistol and held it until the back stretch, when he was nailed by Dawson, and all three raced past the tape in a bunch. In the second lap they raced scarcly a length apart up the back stretch, with the Fal sandwiched between the Marmons, with the other three over one-quarter-mile back. In the third circuit Heinemann passed Gelnaw. This position was maintained to the finish.

In the second day's race for this division the number was increased by two six cylinder McFarlans, which could not be

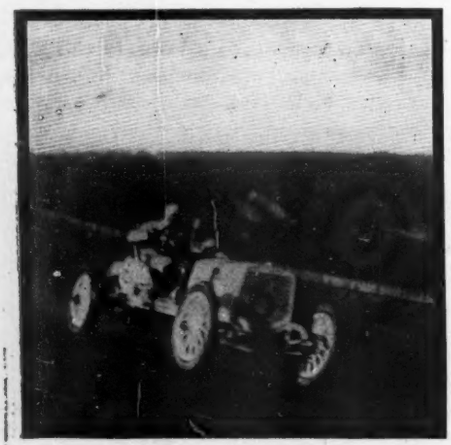
200 MILES—WON BY JOE DAWSON IN MARMON, WITH MULFORD, LOZIER, SECOND

60 Miles	70 Miles	80 Miles	90 Miles	100 Miles	110 Miles	120 Miles	130 Miles	140 Miles	150 Miles	160 Miles	170 Miles	180 Miles	190 Miles	200 Miles
56:16	58:12	67:31	82:27	90:15	98:01	106:06	114:59	123:04	131:48	139:40	147:32	155:23	163:15	171:12:72
50:08	58:00	66:07	81:03	88:56	96:50	106:58	114:53	112:45	131:46	139:39	147:31	155:22	163:15	171:16:30
52:23	60:35	68:43	83:46	91:49	99:57	110:08	118:05	126:00	134:08	143:26	151:29	159:28	169:01	177:32:50
54:32	63:16	79:00	87:45	96:30	105:14	114:07	122:58	131:52	140:48	149:44	161:10	170:16	179:06	187:58
56:59	65:58	81:56	90:55	99:52	108:46	117:39	126:33	135:24	142:11	153:19	162:11	171:04	180:14	189:46
51:07	63:37	81:30	89:38	97:44	105:54	114:04	122:19	130:35	144:22	160:30	168:50	177:21	185:48	Running
58:48	68:15	84:42	94:06	103:30	112:57	122:28	132:02	141:35	151:10	160:42	170:15	179:49	Running	
60:28	69:53	87:43	Motor troubles											
52:54	Connecting rod bearing burned out													
Broken tappet mechanism														

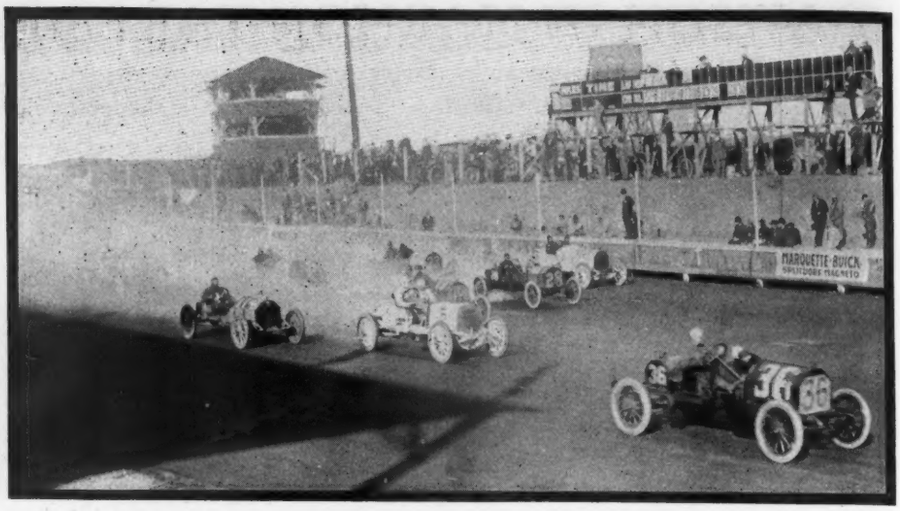
got ready for the first day. The race was for 12 miles. Dawson and Heinemann took the lead from the jump, Gelnaw having to use a new motor in his Falcar, and which was not working at its best. Heinemann took a lead of 3 seconds in the initial circuit on his team mate, Dawson, but lost a second in the next lap, lost still another in the third circuit, held his own in the fourth, but lost all advantage in the fifth, so that the two were radiator to radiator down the stretch. In the last lap Dawson drew 2 seconds to the good, setting the remarkable pace of 70.2 miles per hour. At the finish the others were over a minute behind.

The racing among the cars in the 301-450 cubic inch class was of a high class, as the times show. There were but two races in this division, both stock to the letter. In a 100-mile race the first day for the Coca Cola trophy, Gelnaw in his Fal averaged 69.5 miles for the distance, with a Westcott second and Dawson's Marmon third. In the contest on the second day at 14 miles Dawson won out handily in the remarkable time of 11:30, or exactly 73 miles per hour.

The Coca Cola event at 100 miles was the big attraction of the opening day, and it is questionable if there ever has been any other century grind on a speedway that has been so filled with thrills until the very finish of the contest. Dawson in the Marmon led from the first circuit, until 98 miles, he was given the green flag, indicating that he had but another lap of 2 miles to go. He was over 6 minutes ahead of Gelnaw in the Fal, who was second. As Wagner waved the green flag it was seen that Dawson was coasting into his pit, and worry on the faces of the Marmon pit attendants and anxiety on the part of the spectators brought a silence over the course. Dawson stopped and announced he had no power. The motor was all right, but the rear wheel would not respond. The driveshaft in the right half of the rear axle had twisted off at the outer end, where it carries a flange. As Dawson drove alone, he had to make the repair alone. Disconsolate but not discouraged, he jacked up, first, the left wheel, found it was all right, and then went at the right. He withdrew the broken member, inserted a new one, and was off. But the plugging Gelnaw was too close upon him, and had gained the necessary distance and was in the last lap when Dawson dashed away from the pits, the grand stand resounding with applause. He made a remarkable fast lap, but could not catch the Falcar, which finished first in 86:17, and Knight in the Westcott, which finished second in 86:32, but 15 seconds back of the winner. Dawson's time was 87:27 Basle, driving a Pope-Hartford, was fourth in 90:07; Pearce in a Falcar was fifth in 93:47; a McFarlan six came sixth in 98:51, and another McFarlan was seventh in 100:34. Of the nine cars to start, seven finished. No. 11 Marmon, driven by Heinemann, was first out 70 miles with a destroyed bearing in a connecting rod, and No. 14, Fal, driven by Hughie Hughes, dropped out at 80 miles with a broken shaft in the gearset.



HORAN IN LOZIER SIX



FIELD STARTS IN CITY OF ATLANTA RACE

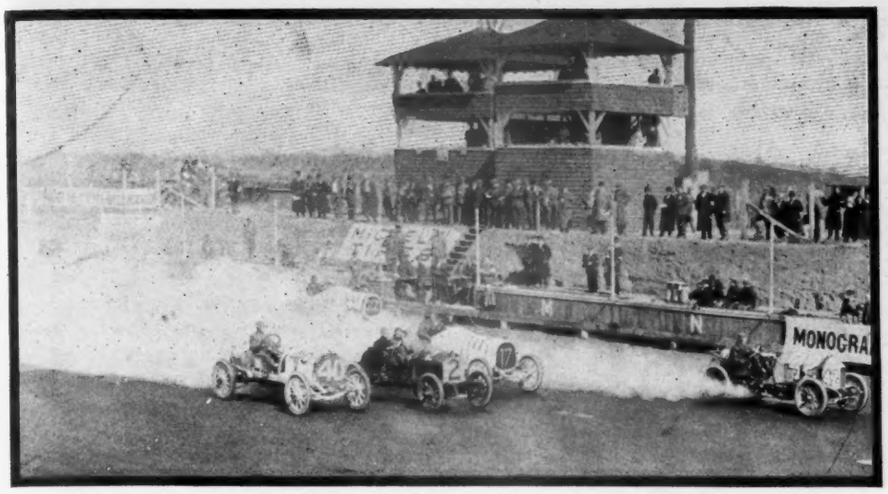
It is remarkable in this race that of the seven cars to finish all averaged 60 miles per hour or over, a condition which was never before attained in any 100-mile race on a speedway for this class of cars.

This race had an auspicious beginning, all of the nine getting away in good manner. Dawson and Heinemann, in Marmons, and Basle, in the Pope-Hartford, were soon in the lead, with Gelnaw in his Fal and Knight in the Westcott side by side some distance back, and Hughes, Pearce and the two McFarlans forming a third group. This three-group business continued for some time, in fact up to 70 miles there were three features in the race: The two Marmons fought for first place, the Gelnaw Fal, Westcott and Pope battled for second position, and Hughes, Pearce and the two McFarlans fought among themselves as a rear guard.

Dawson began setting the pace. Before 10 miles were covered the three leaders, Dawson, Heinemann and Basle, had lapped the two McFarlans, which were running last. Dawson had a lead of 47 seconds on Gelnaw. In the sixth lap Dawson had gained a lap on Hughes and Pearce, and at 44 miles Dawson had lapped the entire field except his team mate, Heinemann. He continued this pace. At 60 miles he was 5 minutes in the lead; at 70 miles he was about the same; at 80 miles he was nearly 6 minutes ahead of Gelnaw, and at 90 miles he was a little over 5, having lost to Gelnaw, who was running with great consistency. At 98 his accident happened, and what took place has already been told.

All the time that Dawson was pulling away from the rest of the field the greatest duel between rival makes was being enacted in the struggle for second place between Gelnaw and Knight in a Westcott. These two cars raced side by side, never more than a length apart, until the ninety-eighth mile, when the Wescott broke a valve and Gelnaw drew away. The fight between these two was the feature of the race. They finished the second lap side by side; at 10 miles they were in the same position; at 48 miles they were still side by side and racing with the Pope, which at this time was one lap ahead of them. At 68 miles the Pope had to stop to change a right rear tire and was dropped into fourth place, the Fal and Wescott being second and third. From 70 miles on the see-saw between Gelnaw and Knight continued. Gelnaw would pass on the stretch and lose a few feet on the turn. One lap Wescott was a foot ahead, passing the grand stand, and the next lap Gelnaw had a wheel's length advantage. The tabulation on another page gives the positions of the cars at 10-mile intervals. It should be noted that in this race five cars made the distance without a stop, namely, Gelnaw's Fal, Pearce's Fal, Knight's Westcott and the two McFarlan sixes.

The contests among stock cars in the 451-600 cubic inch class was the hottest of the entire meet. In not a single race was there a runaway for the winner and in fact, it was a struggle until the tape was



START OF 10-MILE FREE-FOR-ALL ON FRIDAY AFTERNOON

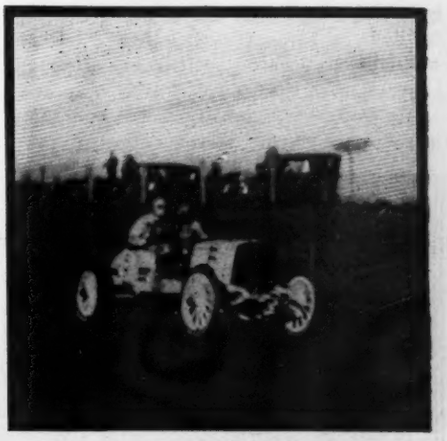
crossed. On the opening day there was a 20-mile race with four starters—Mulford in the four-cylinder Elgin Lozier, Horan in a six-cylinder Lozier, Joe Matson in a Simplex and Basle in a Pope-Hartford. The Simplex took the lead but was passed by Mulford in the second circuit. The Simplex held second place until 15 miles, when the second Lozier crept up into second. Meantime the Pope was neck and neck with the Simplex, and finished but .3 second behind it. The Lozier carried off first and second, with Simplex third. Mulford's average was 74 miles per hour. His time was 16:13, Horan's time was 16:32, Matson's was 16:36.4, and Basle's 16:34.7.

It was in the 200-mile race on Friday, however, that the real struggle among stock cars in this division took place. In brief, it was one grand fight for 100 laps between Ralph Mulford, winner of the Elgin National trophy, in his four-cylinder Lozier, and Joe Dawson, winner of the Cobe trophy race on the Indianapolis speedway, in his four-cylinder Marmon. These two cars were never 2 minutes apart from start to finish, and at the end Dawson led by the close margin of 31.5 seconds. For laps they raced not 100 yards apart. At one time Mulford was leading by 80 seconds, then Dawson started cutting this down 1 or 2 seconds to the lap and when he had almost caught his rival a bursted tire chilled his ardor and he was back 75 seconds again. Soon after this Mulford lost a tire and Dawson jumped into the lead, but it was only for one lap, for another tire went, and the Lozier once more took up the pace-making task. So intense was the interest that the 10,000 spectators were on their feet all of the time. If Mulford gained on Dawson on the back stretch the Lozier enthusiasts in the grand stand and bleachers went wild with joy; and when the Marmon gained on its rivals the other party took up the chorus. The applause from the grand stand was always a true thermometer of the way the race went. Both men shared in the applause.

Viewing the race solely from a standpoint of the struggle between the Lozier and Marmon cars, for it was from start to finish a contest among these, due to the early dropping out of Basle's Pope and the tire troubles of Matson with his Simplex. From the start it seemed that Mulford set out to make a merry pace in the front. Horan followed him and Dawson trailed Horan. Dawson was content with this trailing game until Horan stopped for tires, and then he took up the task of catching Mulford. The quickened speed needed in this work burned his tires and, when within striking distance of his prey, his pneumatics went back on him. At 10 miles both Loziers led, with Simplex third and Dawson fourth. At 20 miles the two white Loziers were ahead with Dawson and Matson, running 100 yards back. At 30 miles Mulford had drawn the length of the grand stand ahead of Horan and Dawson. At 40 miles Mulford was 6 seconds ahead of Horan and 13 ahead of Dawson. At 50 miles Horan stopped 2 minutes to change a right rear tire and take on water. This lost him second position. At 70 miles Mulford was 5 seconds ahead of Dawson; at 78 miles Dawson stopped and changed a right rear casing in 48 seconds. This stop gave Mulford a lead of 82 seconds at 80 miles. Dawson opened up and was gaining 1 second to the lap on his rival. In one lap Dawson gained 2 seconds, and in the next he lost it, so that at 90 miles he was still 80 seconds back. At 100 miles Dawson had cut the lead to 70 seconds. It was at 118 miles that the climax of excitement was reached, when Mulford drew up at his pit with a right rear casing lost. It took 92 seconds to make the change. The car rolled ahead off the jack and caused much loss of time. While the tire change was being made, Dawson leaped into the lead for the first time in the race. But what was the use, because in the very next lap, at 120 miles, he drew up with the right rear flat and his two pit workmen, Ray Harroun and Heinemann, made the change in 52 seconds. This stop put Mulford again in the lead. Mulford was but 15 seconds in the lead. At 130

CARS THAT RACED AT THE ATLANTA SPEEDWAY MEET

No.	Car	Driver	No. Cyl.	Bore	Stroke	Cap'y	N. S.
1	E-M-F	Cohen	4	4	4-5	226	Stock
2	Fiat	Bragg	4	5⅛	7-5	.....	N. S.
3	Fiat	Stoddard	4	5½	5-1	.....	N. S.
5	Lozier	Mulford	4	5⅝	6	544	Stock
6	Lozier	Horan	6	4⅝	5½	567	Stock
11	Marmon	Heinemann	4	4-5	5	318	Stock
12	Falcar	Gelnaw	4	4⅛	5¼	280	Stock
14	Falcar	Hughes	4	4⅛	5¼	280	Stock
17	Pope-Hartford	Basle	4	4¾	5½	390	Stock
18	Cole	Endicott	4	4-5	4-5	286	Stock
20	Firestone	McKinstry	4	4	4	201	Stock
21	Marmon	Harroun	4	4-5	6-5	597	Stock
22	Pope-Hartford	Disbrow	4	4¾	5-5	390	Stock
23	McFarlan	Clemens	6	3⅝	3 31-32	247	Stock
24	McFarlan	Adams	6	3⅝	3 31-32	247	Stock
25	Marmon	Heinemann	4	4-5	4-5	286	Stock
26	Westcott	Knight	4	4¾	5	354	Stock
27	Falcar	Pearce	4	4⅛	5¼	280	Stock
28	Marmon	Dawson	4	4-5	5	318	Stock
29	Firestone	Woodside	4	4	4	201	Stock
30	Chalmers	Moss	4	3⅞	4½	218	Stock
32	E-M-F	Witt	4	4	4-5	226	Stock
33	Parry	Snyder	4	4¼	4-5	255	Stock
35	Stearns	Rutherford	4	5⅜	5⅞	533	N. S.
36	Simplex	Matson	4	5¾	5¾	598	Stock
37	Abbott-Detroit	Roberts	4	4	4¼	213	Stock
38	Abbott-Detroit	.....	4	4	4¼	213	Stock
39	Abbott-Detroit	McIntyre	4	4	4¼	213	Stock
40	Marquette-Buick	Burman	4	6	5¼	593	N. S.
42	Stoddard-Dayton	Harding	4	5¼	5¾	497	N. S.
43	Firestone	McKinstry	4	4-5	5	318	Stock
44	Simplex	Matson	4	6-10	5¾	661	N. S.
45	Marmon	Heinemann	4	4-5	4-5	286	Stock
46	American	Wallace	4	5¾	5½	571	N. S.



MULFORD IN LOZIER FOUR

SUMMARIES OF SHORT RACES AT ATLANTA ON THURSDAY

EVENT 2—TWELVE MILES, 161-230 CLASS B

No.	Car	Driver	2	4	6	8	10	12
32	E-M-F	Witt	2:10	3:53	5:41	7:30	9:17	11:05
37	Abbot-Detroit	Mont. Roberts	2:03	3:54	5:41	7:30	9:19	11:09
38	Abbot-Detroit	Mort. Roberts	2:10	4:06	6:02	7:58	9:57	11:57
1	E-M-F	Cohen	2:05	4:04	6:05	8:07	10:30	12:15
39	E-M-F	McIntyre	2:24	4:35	6:45	8:54	11:04	.....
30	Chalmers	Moss	2:53	5:27	7:59	10:31	.....	.....
20	Firestone	McKinstry	2:15	4:12	.....	.....	.....	.....

EVENT 4—TEN MILES, 231-300 CLASS B

No.	Car	Driver	2	4	6	8	10
25	Marmon	Dawson	1:55	3:36	5:16	6:55	8:34.7
45	Marmon	Heinemann	1:55	3:36	5:17	6:57	8:39.4
12	Falcar	Gelnaw	1:56	3:37	5:18	6:59	8:43.6
27	Falcar	Pearce	2:05	3:58	5:49	7:40	9:32.4
14	Falcar	Hughes	2:17	4:14	6:12	8:04	9:57.4
33	Parry	Phillips	2:11	4:10	6:08	8:05	10:02.6

EVENT NO. 5—FOUR MILES, SOUTHERN AMATEUR CHAMPIONSHIP

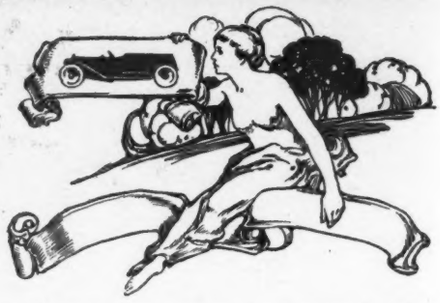
No.	Car	Driver		
44	Simplex	Matson	1:40	3:20
3	Flat	Stoddard	1:57	4:58

EVENT 6—TEN MILES FREE-FOR-ALL

No.	Car	Driver	2	4	6	8	10
40	Marquette-Buick	Burman	1:50	3:16	4:43	6:11	7:42
44	Simplex	Matson	1:45	3:20	4:54	6:27	8:04
2	Flat	Bragg	1:41	3:12	4:43	6:20	8:20
17	Pope-Hartford	Basle	1:54	3:31	5:08	6:45	8:24
35	Stearns	Rutherford	1:51	3:33	5:16	6:58	8:40

EVENT 7—TWENTY MILES, CLASS B—451-600

No.	Car	Driver	4	8	12	16	20
5	Lozier	Mulford	3:24	6:34	9:45	12:58	16:13
16	Lozier	Horan	3:29	6:44	9:57	13:14	16:32
36	Simplex	Matson	3:26	6:40	9:56	13:17	16:36.4
17	Pope-Hartford	Basle	3:29	6:44	9:57	13:16	16:36.7



miles Dawson had cut the 15-second lead to 9 seconds, and was traveling fast, gaining 1 to 2 seconds to the lap. Dawson made one lap at this time at an average of 78.2 miles per hour. At 134 miles Mulford's lead was reduced to 3.5 seconds, at 136 miles it was 1.5 second and at 138 miles they were radiator to radiator as they passed the grand stand, the crowd cheering itself hoarse. As they swung into the first turn Dawson was seen to slow perceptibly and Mulford drew away. It was another tire, the right front having gone this time. It was a rapid change, 35 seconds being the time lost from the time the car stopped until it was off again in pursuit of the leader.

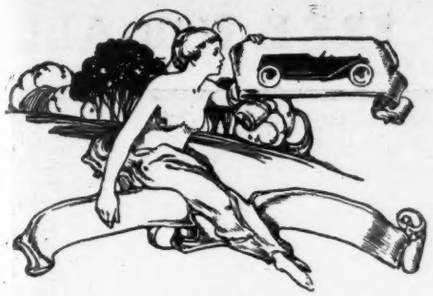
Mulford now was 75 seconds ahead. But a few laps later at 144 miles Mulford stopped to change a right front, doing the job in 40 seconds and getting away with a scant margin of 1 second. He held this for several laps. At 170 miles he still led by 1 second. It was at 182 miles that the sensation of the race occurred when Dawson wide open coming down the broad homestretch passed his competitor and forged half a length to the front. This brought the Marmon enthusiasts in the grand stand to their feet and a mighty cheer followed the cars down the stretch. At 190 miles the two raced side by side in the gathering darkness; at 192 they remained the same; so they did at 194; at 196 Dawson led by a length; at 198 he was 50 yards ahead and in the last lap he increased this slightly. It was noted that Mulford suffered a bad skid as he entered the first turn on the third to last lap. The reason was plain at the finish—his right front tire was without a tread, the skid having occurred when the tread loosened from the fabric.

But while the two leaders were battling for first place in their never-to-be-forgotten struggle many contests were taking place among the other rivals. Of the eleven starters four fell out by the wayside. Basle's Pope dropped out at 22 miles with a broken valve and piston. A McFarlan stopped at 42 miles with a broken tappet mechanism. Heinemann's Marmon fell out at 64 miles with a burned-out connecting rod bearing, which had been put in the day previous. No. 18 Cole stopped at 90 miles with motor trouble. The rest of the cars kept running until the darkness forced them to stop. No. 14 Falcar driven by Hughes was the only contestant to go the 200 miles without making a single stop. One of the McFarlan sixes ran until compelled to stop because of darkness without having stopped once.

From the start to finish of the race there were in reality three contests taking place. The duel for first position has already been mentioned. After this came a fight among the Simplex and Gelnaw's Fal for leadership in the second group and in the third aggregation were the McFarlan and one other Fal, together with the Cole while it lasted. At 12 miles the leaders had lapped the two McFarlans and the Cole; and at 26 miles Mulford lapped these three a second time. At 60 miles Horan stopped to change a right rear tire and take on water and oil, the stop lasting 2 minutes. At 68 miles Matson's Simplex stopped 48 seconds to change a right rear. At 100 miles Horan stopped 105 seconds to change both rear tires. At 144 miles Matson made a long stop, changing a right rear and taking on water. It was found that a union at the pump was loose and the motor had been running dry. After this distance there was not any tire changing

TWENTY-MILE FREE-FOR-ALL ON THURSDAY—WON BY HARROUN IN A MARMON

No.	Car	Driver	2	4	6	8	10	14	16	18	20
21	Marmon	Harroun	1:42	3:14	4:45	6:15	7:46	10:49	12:21	13:54	15:27
44	Simplex	Matson	1:44	3:19	4:54	6:28	8:02	11:11	12:46	14:20	15:53
5	Lozier	Mulford	1:50	3:24	4:54	6:03	8:07	11:18	12:54	14:30	16:07
6	Lozier	Horan	1:56	3:33	5:14	6:53	8:30	11:45	13:24	15:02	16:39
17	Pope-Hartford	Basle	1:56	3:35	5:14	6:33	8:32	11:49	13:26	15:06	16:41
35	Stearns	Rutherford	1:51	3:32	5:14	6:54	8:35	12:01	13:43	15:26	17:08
2	Flat	Bragg	1:42	3:17	4:50	6:23	7:55	11:03	13:03	Blew out gasket	
22	Pope-Hartford	Disbrow	2:10	3:49	6:11	Broke valve and piston					
40	Marquette-Buick	Burman	1:38	3:15	Demountable rim came off						
42	Stoddard-Dayton	Harding	1:53	Broke valve and piston							



with any of the cars, the cool of the evening making the task on them much easier. At 150 miles the Simplex was fourth, four and one-half laps back of the leaders; Gelnaw in the Fal was fifth, five and one-half laps back; Hughes was sixth, six and one-half laps back, and the McFarlan was eleven laps behind the leader. One feature of the speedway races which must not be overlooked was the free-for-all events which were contested for among cars that had not to be stock machines. All told on the 2 days there were four free-for-alls and Harroun in his No. 21 Marmon took one of these, the only one in which he was entered, and Burman in model 100 Marquette-Buick took the other three. The first free-for-all was at 20 miles. Harroun won it in 15:27, or at a pace of 77.6 miles per hour. In this race the Fiat 90 and the big Marquette-Buick were the Marmon rivals. Burman and Bragg got away first and led up the back stretch. In the second lap Harroun passed the Fiat, gaining on the curves, and drew close to the Buick. In lap three the Marmon led, the Buick having stopped for a loose demountable rim. In the next lap the Fiat blew a gasket and dropped out. Matson in the 90 Simplex and Mulford in the Lozier were battling in this race. The Simplex was second, Mulford third and Horan fourth.

The second free-for-all among practically the same cars was one of the most spectacular of the meet. At the starter's pistol Burman stalled his Buick and jumped out to crank it, leaving the low speed engaged. His mechanician jumped from the pit and cranked the big fellow. In the meantime Burman was at the side of the car. It started without him. He jumped in, and the mechanician sprang to the side of the car and turned the switch from the battery to the magneto. In the meantime Bragg and the other leaders were at the first turn. Burman opened up. In the second lap he was into second position; in the third lap he was closing on Bragg in the 90 Fiat and in the fourth lap he passed Bragg. He gained to the finish, doing the 10 miles in 7:42 or at 77.9 miles per hour. The schedule shows the position of the others.

The third free-for-all, a 10-mile event, was a runaway for Burman. He led the Fiat from the start and finished in 7.23, a pace of 81.2 miles per hour, the fastest average in any race at the entire meet. There also started in this free-for-all besides Burman and Bragg, Basle in a Pope-Hartford, Harding in a Stoddard and Disbrow in a Pope, who finished as named.

SUMMARIES OF SHORT RACES AT ATLANTA ON FRIDAY

EVENT 9—TEN MILES, 161-230 CLASS

No.	Car	Driver	2	4	6	8	10
32	E-M-F	Witt	2:1	3:49	5:36	7:23	9:12
29	Firestone-Columbus	Frayer	2:5	4:2	5:58	8:9	*
37	Abbott-Detroit	Montague, Roberts	2:5	3:54	5:48	7:31	9:18
20	Firestone-Columbus	McKinstry	2:8	3:56	5:48	7:31	9:19
38	Abbott-Detroit	Mortimer, Roberts	2:19	4:16	6:12	8:7	10:4

* Did not finish.

EVENT 10—TEN MILES, FREE-FOR-ALL

No.	Car	Driver	2	4	6	8	10
40	Marquette-Buick	Burman	1:37	3:3	4:29	5:55	7:23:55
2	Fiat 90	Bragg	1:37	3:5	4:31	6:1	7:30:30
17	Pope-Hartford	Basle	1:54	3:31	5:8	6:44	8:23:95
42	Stoddard-Dayton	Harding	1:48	3:22	4:57	6:31	8:50:32
22	Pope-Hartford	Disbrow	1:54	Broke rear axle housing			

EVENT 11—TWELVE MILES, 231-300, CLASS B

No.	Car	Driver	2	4	6	8	10	12
25	Marmon	Dawson	1:57	3:36	5:15	6:55	8:35	10:15:5
45	Marmon	Heinemann	1:54	3:34	5:14	6:54	8:35	10:15:7
14	Falcar	Hughes	2:1	3:50	5:40	7:32	9:22	11:15
24	McFarlan	Adams	2:9	4:5	6:00	7:54	9:48	11:43
23	McFarlan	Clemens	2:15	4:14	6:12	8:10	10:7	12:4
33	Parry	Phillips	2:16	4:16	6:15	8:14	10:10	12:5

EVENT 12—TWENTY MILES

No.	Car	Driver	4	8	12	16	20
40	Marquette-Buick	Burman	3:4	5:58	8:56	12:6	15:18
2	Fiat 90	Bragg	3:6	6:6	9:23	12:33	15:49
42	Stoddard-Dayton	Harding	3:19	6:27	9:35	12:40	15:51
17	Pope-Hartford	Basle	3:29	6:44	9:59	13:16	16:34
35	Stearns	Rutherford	3:36	7:4	10:31	13:59	17:27

EVENT 14—FOURTEEN MILES, 301-450 CLASS

No.	Car.	Driver.	2	4	6	8	10	12	14
11	Marmon	Dawson	1:54	3:30	5:4	6:43	8:16	9:50	11:30
28	Marmon	Harroun	1:51	3:29	5:7	6:43	8:18	9:55	11:31
17	Pope-Hartford	Basle	1:54	3:30	5:6	6:43	8:19	9:55	11:32
43			2:10	3:52	5:35	7:17	8:58	10:40	12:23

EVENT 15—TEN MILES, AMATEUR FREE-FOR-ALL

No.	Car	Driver	1	2	6	8	10
44	Simplex	Stoddard	1:47	3:16	4:46	6:16	7:46.6
3	Fiat 60	Heitmeyer	1:43	3:14	4:46	6:17	7:48.75
35	Stearns	Rutherford	1:57	3:42	5:28	7:15	9:4.10

EVENT 16—TEN-MILE HANDICAP, CLASS D

No.	Car	Driver	Hdcp.	Time
23	McFarlan	Clemens		9:58
24	McFarlan	Adams	3:6	10:33
42	Stoddard-Dayton	Harding	2:36	10:34
17	Pope-Hartford	Basle	2:09	10:36
32	E-M-F	Witt	1:24	10:39
35	Stearns	Rutherford	2:06	10:45
37	Abbot-Detroit	Roberts	1:22	10:52
43	Firestone-Columbus	Frayer	1:43	

100 MILES, COCA-COLA TROPHY CLASS B, 201-450 CUBIC INCHES—WON BY GELNAW IN FALCAR

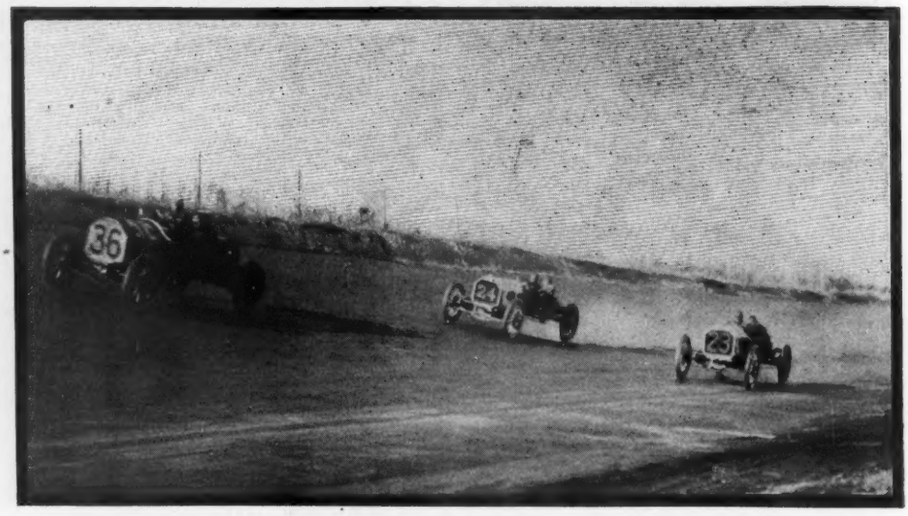
No.	Car	Driver	10	20	30	40	50	60	70	80	90	100
12	Falcar	Gelnaw	8:56	17:40	26:23	35:01	43:36	52:12	60:46	69:19	77:48	86:07.6
26	Westcott	Knight	8:57	17:41	26:23	35:02	43:36	52:13	60:46	69:19	77:48	86:32.15
28	Marmon	Dawson	8:09	16:01	23:57	31:54	39:47	47:47	55:43	63:45	72:01	87:27.3
17	Pope-Hartford	Basle	8:23	16:33	24:54	33:24	41:53	50:31	61:46	70:41	79:23	90:07
27	Falcar	Pearce	9:47	19:05	28:24	37:49	47:13	56:35	65:53	75:11	84:30	93:47
24	McFarlan	Adams	10:31	20:28	30:20	40:16	50:00	59:45	69:30	79:17	89:06	98:51
23	McFarlan	Clemens	10:41	20:42	30:49	40:52	50:50	60:44	70:39	80:34	90:39	100:34
14	Falcar	Hughes	9:37	18:53	27:59	36:56	45:54	54:52	63:46	72:44	Broke sh'ft in G. S.	
11	Marmon	Heinemann	8:22	16:24	24:31	32:46	40:57	49:08	Burned out connecting rod bearing			

HORAN IN LOZIER WINS LONG FREE-FOR-ALL

ATLANTA, GA., Nov. 7—In a sensational drive characterized by extreme speed and absolute freedom from mechanical troubles, Joe Horan in a six-cylinder Lozier won the big 250-mile free-for-all class D event today, which closed the fall meet on the local speedway. His time for the distance was 3 hours 26 minutes and 15 seconds, an average of 71.6 miles per hour, which breaks the American track record formerly held by Burman.

Just 1 minute and 6 seconds later Bob Burman in his big Marquette-Buick flashed across for second place, followed in 1 minute 48 seconds by Joe Matson in the big Simplex for third place. Fourth money went to Ralph Beardsley in a Simplex and fifth to Ralph Mulford in the four-cylinder Lozier.

Burman lost the race through tire trouble. Nine times he was forced to spend precious seconds at the pit while Horan escaped with but three changes. Matson changed tires four times and Mulford four. But Mulford had trouble with a broken exhaust valve stud in the fourth lap and lost so much time that he couldn't get back with the first three. Beardsley only had two changes but his car seemed to lack speed.

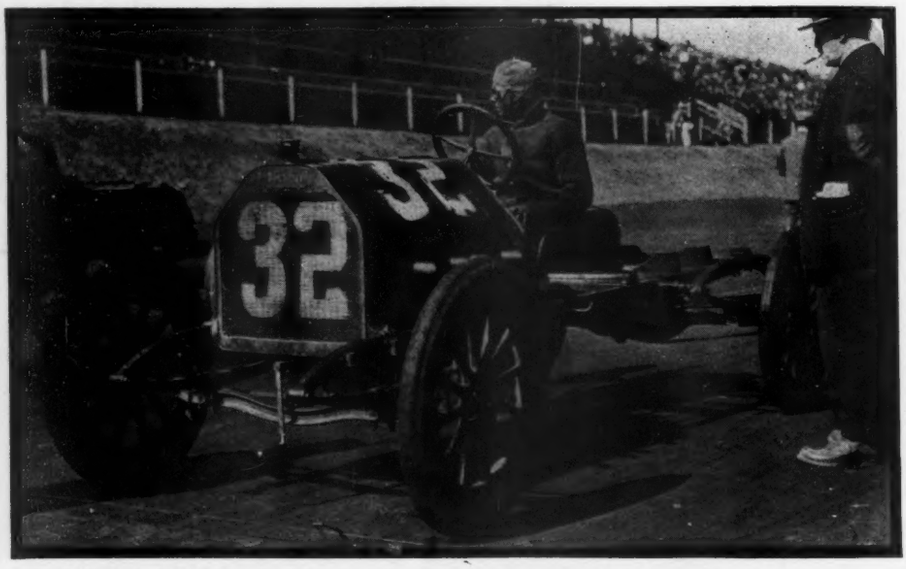


SIMPLEX AND TWO MCFARLANS IN CITY OF ATLANTA RACE

For the first few miles Matson looked like all the money, but as it afterward developed his valves were too light to stand the strain and the valve seats burned out to such an extent that the engine could not hold full compression. From bursts of 88-mile speed he slowed down till 72 was about all that he could do. The Lozier, driven by Horan, kept up a splendid uniform speed from start to finish and deliberately maintained the schedule which eventually won. Burman was forced to do wonderful driving at every angle to make up for the time lost in tire changes.

Perhaps one of the most interesting pieces of work of the entire race was furnished by the McFarlan, driven by Bert Adams, and by Harrell in a Halladay. The latter never made a stop during the entire race and at the finish was suffering apparently only from a dirty spark plug that caused an occasional miss. Adams stopped but once in the eighty-nine laps to replenish his oil tank, which was very small, holding only about 8 gallons. Neither of these cars showed sensational speed, but both showed real consistency in their running.

The Fiat, owned by Asa G. Candler, Jr., and driven by W. J. Stoddard, a local driver who turned professional today to compete for the big money, showed steering gear weakness and nothing but providence saved a double tragedy. In the thirty-eighth lap the steering arm broke and the car plunged up to the top of the track, and crashing through the fence dashed down a 32-foot embankment into the sand and earth below. Fortunately,

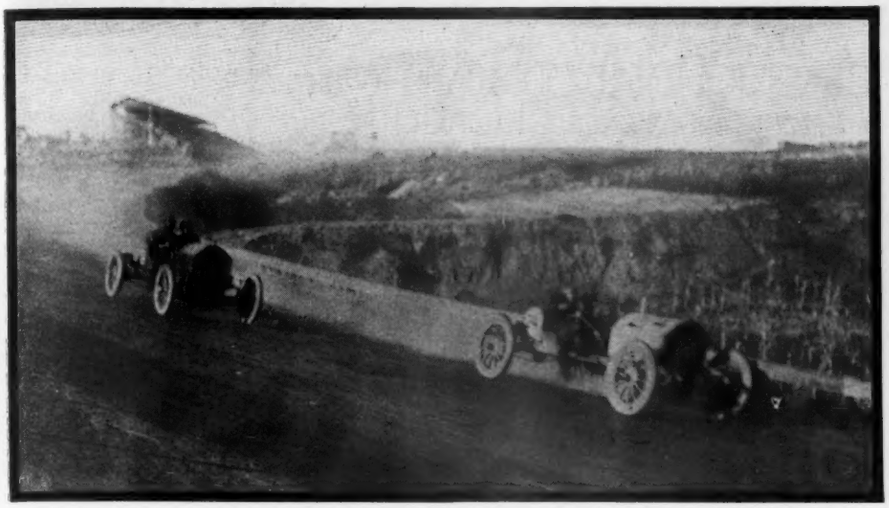


WITT IN E-M-F, A WINNER OF CLASS EVENTS

TABULATED RESULTS OF THE 250 MILE FREE-FOR-ALL RUN ON MONDAY, THAT WAS WON BY

		Cyl.			10 mi.	20 mi.	30 mi.	40 mi.	50 mi.	60 mi.	70 mi.	80 mi.	90 mi.
6	Lozier	6	4⅝x5½	Horan	8:11	16:12	24:06	32:09	40:19	49:01	58:19	66:16	74:20
40	Marquette-Buick	4	4½x5½	McKinstry	8:02	15:47	23:32	33:59	43:00	50:57	59:50	67:33	75:14
44	Simplex	4	6 1-10x5¾	Matson	8:19	16:13	24:05	32:02	40:05	49:46	57:54	66:03	74:02
36	Simplex	4	5¾x5¾	Beardsley	8:30	16:38	24:45	33:07	41:51	50:18	58:38	66:58	75:32
5	Lozier	4	5⅝x6	Mulford	41:05	48:57	56:48	65:54	73:53	81:53	89:17	97:24	107:47
24	McFarlan	6	3⅝x4	Adams	9:47	19:08	28:21	37:46	47:00	56:16	65:30	74:47	84:04
34	Halladay	4	4½x5	Harrell	10:19	20:15	30:46	40:59	51:15	61:51	72:35	82:52	92:18
43	Firestone-Columbus	4	4½x5½	Disbrow	11:31	20:56	29:54	38:51	47:58	57:01	66:14	75:42	86:48
26	Wescott	4	4¾x5	Knight	8:39	17:16	25:44	34:15	42:45	51:07	69:14	80:14	95:04
21	Marmon	4	4½x6½	Harroun	7:53	15:35	23:25	31:24	39:32	47:40	55:51	63:58	72:03
28	Marmon	4	4½x5	Dawson	8:13	16:12	24:07	32:09	40:07	48:12	56:18	64:29	72:28
3	Fiat	4	4x5½	Stoddard	8:33	17:08	25:49	38:14	47:10	56:00	69:50	Out 76 miles;	
13	Simplex	4	6 1-10x5¾	Church	8:13	16:13	27:06	37:38	Out 81 miles; broken crankshaft				
17	Pope-Hartford	4	4¾x5½	Basle	Out 2 miles; broken valve stud								
42	Stoddard-Dayton	4	5¼x5¾	Harding	Out 14 miles; stripped cam gears								
22	Pope-Hartford	4	4¾x5½	Disbrow	8:36	Out 10 miles; cylinders lifted							

SIX-CYLINDER SMASHES 250-MILE RECORD



McFarlan and Cole in 200-Mile Race on Friday

the car stayed on its wheels and neither driver nor mechanician was injured beyond a few bruises. This is the second time this same car has suffered a broken steering arm or bar with Stoddard driving.

The Simplex, with Church up, in the twentieth lap, also furnished a thrill, which, like the Fiat, providentially, was not fatal. The crankshaft broke and Church was unable to get his clutch out. The sudden stoppage took the car beyond his control and he crashed through the lower fence and literally tore his car to pieces before it stopped.

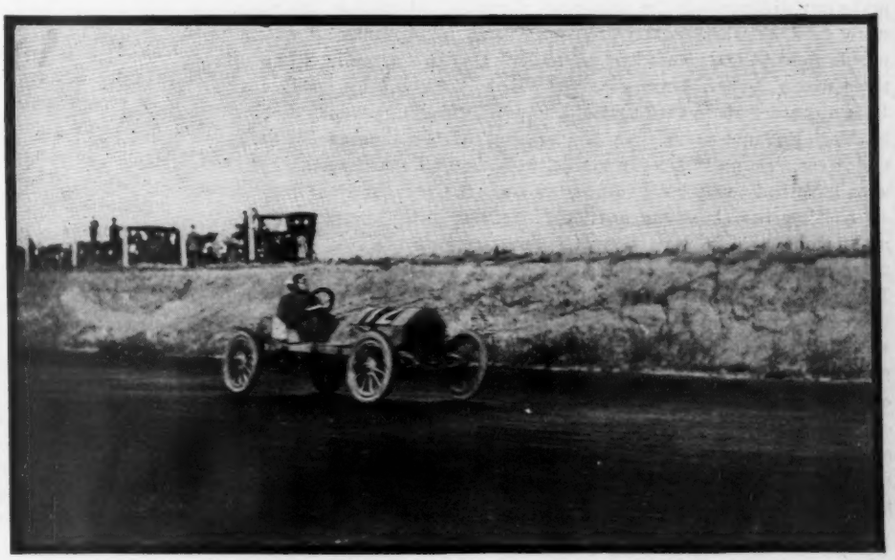
The two Pope-Hartfords kept up their hard luck records and Basle's car was out on the second lap with a broken stud in one of the valve guides. Hugh Harding's Stoddard-Dayton went seven laps and then stripped the cam gears and retired.

Dawson and Harroun in the two Marmons looked like sure money men up to 180 miles. A cracked cylinder put Dawson out and a sheared pin on the magneto shaft fixed Harroun. They were in the leading bunch all the way nearly to the time they dropped. Dawson first showed trouble in the seventy-eighth lap, when his radiator went dry. A leak was certain, but not till the eighty-seventh lap was it clearly known just what had happened. He tried to get away with it by stopping often for water, but the leak grew worse and in the ninety-second round he finally quit.

Harroun first noticed trouble in the eighty-first lap when his spark began to retard too much. He stopped for an inspection but resumed. In the eighty-eighth he stopped to locate a crack in his exhaust manifold, but again took up the grind. In the ninety-third lap, however, his engine went to the bad entirely because of the accident to the magneto shaft and in fourth position he withdrew, after vainly trying to effect repairs.

Knight in a Westcott had lots of trouble all the way, finally quitting in the 208th mile with a blown-out water gasket. Up to that time he had had to change four broken valves and drive from the thirty-first lap with his lower truss rod broken and tied up to the frame. McKinstray in a Firestone-Columbia developed a leaky water gasket in the fifty-fourth lap, which caused a stop in the sixty-ninth and retirement in the 208th mile.

Horan in his winning Lozier crossed the tape the first time in third position. He alternated in third and fourth and kept going till the thirtieth lap, when he stopped for a new right rear tire. This put him in fourth position, but he soon worked back into third and stopped again for a similar change in the seventy-eighth lap. He still retained third with Harroun and Burman ahead till about 170 miles had been covered, when he took second because of Harroun stopping.



Gelnaw in Falcar, Winner of Coca-Cola Cup Race

JOE HORAN IN SIX-CYLINDER LOZIER, A STOCK CAR, WITH BURMAN IN MARQUETTE—BUICK SECOND

100 mi.	110 mi.	120 mi.	130 mi.	140 mi.	150 mi.	160 mi.	170 mi.	180 mi.	190 mi.	200 mi.	210 mi.	220 mi.	230 mi.	240 mi.	250 mi.
82:25	90:01	98:14	106:43	114:52	122:59	132:55	140:55	148:57	157:01	165:01	173:03	181:06	189:11	198:05	206:15
82:51	89:57	99:16	107:19	115:14	123:03	130:52	139:44	149:59	158:07	167:11	175:06	182:45	192:15	199:58	207:21
82:15	90:02	99:51	108:12	117:51	126:04	134:16	142:25	150:39	158:54	168:38	176:51	185:03	193:03	201:08	209:09
84:15	92:21	101:00	109:55	118:27	127:11	135:38	146:21	154:49	163:21	172:06	180:33	189:11	197:53	208:40	217:20
115:40	123:30	131:20	139:07	146:59	154:49	163:58	171:44	179:34	187:22	196:08	203:56	211:45	219:36	227:38	235:45
92:59	103:22	111:53	121:12	130:20	139:46	149:08	158:27	168:03	177:56	187:11	197:42	208:21	218:55	229:46	241:08
104:10	112:24	122:24	132:41	142:52	152:55	162:47	172:34	182:30	192:17	202:04	211:51	221:41	231:42	241:37	251:22
96:13	122:56	132:14	141:42	151:42	186:48	196:47	207:01	217:85	228:23	239:17	Out 208 miles; valves and water gasket				
104:02	112:15	120:34	128:58	137:28	157:13	165:38	187:07	195:24	212:55	221:17	Out 208 miles; blew water gasket				
80:11	88:11	96:21	106:09	113:57	121:47	129:41	137:58	152:18	161:57	Out; steered pin magneto shaft					
80:42	88:25	96:35	105:01	113:00	121:09	133:19	141:06	160:45	Out 184 miles; cracked cylinder water jacket						

broken steering arm

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Finances of Good Roads—Dollars in Balanced Cars

THAT state which continues in not improving its primeval highways will lose more money as the years pass by than would be required in improving those rural thoroughfares. Good roads are one of the greatest assets of any state. Where the roads are good the tourists will go, and where the tourists go the money will be spent. Throughout New England there are states which are improving their main highways in order to turn the increasing stream of summer and autumn tourists to their resorts. The highway commissioners in these states declare that road competition is becoming a grave factor in the matter of vacations with those people who own cars. If there are two adjacent states, one with good roads and the other with those roads that wreck a car, it is a certainty that the tourists will patronize the state with good roads, and it is also certain that during a season the money left in the good-road state will be sufficient to build a great many miles of improved highways.

THE real status of the good roads in the matter of directing tourists to a certain state in preference to another has become of special prominence within the last couple of years. Before that time, if there were certain states with summer resorts, it did not make any difference in the patronage they received whether the roads were good or whether there were roads at all, because all of the people went to the places by train. Now this is changed and in sections where the roads are good the people are going by motor car. It is a characteristic fact that at one of the biggest summer centers in New England more than 75 per cent of the tourists came by motor car. So great has the motor traffic become that immense garages have had to be built to accommodate the cars, and the matter of housing the chauffeur has called for separate hotels for their maintenance. This fact is prima facie proof of the real merit of the car and indirectly of the real value to a state of good roads. There are today states in the union that are not doing anything in the matter of good roads. They are those short-sighted states in which those who hold the keys to the situation imagine that any money spent in building modern roads is simply invested or spent in order to give a few additional luxuries to the man who owns a motor car. Some day these people will awake to the situation. They will awake to it when they discover that the annual statistics show that some enterprising adjoining state has received so many hundreds of thousands of dollars per year direct from traveling holidayers, whereas they have not taken in a cent. They may have better scenery and more interesting natural attractions, but the value of these is diminished because of the poor roads. Today people with cars would sooner go by car to a summering locality than by train and they are in nine cases out of ten going to give first choice to those states having the best highways.

IT is like repeating an oft told tale to refer to what the south is doing at the present time in the matter of building good roads. At the present time 90 per cent of the prisoners in the state of Georgia is engaged in the building of good roads throughout the state. Within the last couple of years thousands of miles of roads have been built within the state and hundreds are being pushed along at the present time. But the south has gone one step further in the good roads question. It has engaged the best experts in the country to solve the problem of building roads. There are scores of counties in the south in which stone cannot be found, and in such cases the building of stone roads would be a tremendous expense. The road experts have discovered that the red clay of the south, mixed in certain percentages with a certain sand, provides an excellent road construction, one which becomes almost as hard as cement and equally impervious to moisture. This discovery has meant millions to the southern states because they have both the sand and the clay, and where the clay is not to be found it is drawn to the required places, and where sand is not obtainable it is hauled.

IT is only by solving the road problem domestically that it can successfully be solved. Should the federal government have declared that only stone roads should be built, no matter what the state, it would have been the same as building a prohibitive wall against the movement in states where stone does not exist. To the New Englander the stone road is the only solution because stone is to be found everywhere, but to the southerner the sand-and-clay combination appeals specially. In Iowa and other central states where gumbo abounds, some solution will have to be arrived at. At present the drag is the best step towards good roads, but once a heavy rain falls its work is undone.

SCARCELY a week passes but the superior value of the stock car as compared with the specially-built machine in racing comes to the front. The signal stock car victory at the Vanderbilt cup race will be remembered, and since then the Atlanta meet has proven a big stock car victory. In the 250-mile race for stock versus non-stock machines, a stock car won against specially-built racing monsters of high power. It is to be hoped that next year more of the manufacturers will see the error of their ways in spending valuable time and large sums of money in bringing out special racing creations with which they hope to slaughter all or nearly all of the existing records. The stock car has proven itself more reliable than the special machine, and it should be. The great trouble with the special racer is that it is rarely if ever a well-balanced machine. The designer may have spent all his efforts to bring power out of the motor, forgetting that a clutch, gearbox and running gear are also essentials; and that in a race the complete car is not stronger than its weakest part. In his stock touring car every part has been tested out: The clutch is adequate for the motor power; the drive shafts are equal to the maximum strain that the motor can impose on them, and so with all the other parts. In short, the stock car is a balanced car.

IT is not alone in the designing of a new model but also in the development from year to year of an old model that the question of the balanced car applies. Frequently manufacturers will speak of having increased the motor power by increasing the valve diameter or adding a fraction of an inch to the stroke, but how often these makers fail to add a moiety of strength to the universal joints or to some other part of the car! If the motor power is increased, there should be a general strengthening of all parts which are called upon to transfer this additional power to the driving wheels. Increasing motor power also calls for larger brakes; it calls for increased strength in the steering parts and it demands stronger springs and framework. If makers would only keep this balanced idea of the car in mind, there would be less work for the traveling trouble man who goes from city to city among the car owners, setting their wrongs right. The balanced car means money saved at the end of the year, and that is what every maker desires.

BIG CARS READY FOR THE GRAND PRIX RACE

SAVANNAH, GA., Nov. 6—Twenty-three cars in the grand prix and sixteen running for the Savannah and the Tiedeman trophies—that was the status of the road-racing carnival of the Savannah Automobile Club when the list closed tonight. Thirteen different makes are represented in the big race and eight in the other two. The list is as follows:

GRAND PRIZE RACE

Car	Driver
Fiat	Wagner
Fiat	Nazzaro
Fiat	DePalma
Benz	Hemery
Benz	Haupt
Benz	Bruce-Brown
Alco	Grant
Roebling-Planche	Roebling
Simplex	Matson
Marquette-Buick	Burman
Marquette-Buick	A. Chevrolet
Marquette-Buick	
Marmon	Dawson
Marmon	Harroun
Lozier	Mulford
Lozier	Horan
Sharp-Arrow	Sharp
Stoddard-Dayton	Harding
American	Wallace
Pope-Hartford	Basle
Pope-Hartford	Disbrow
National	Aitken
National	Wilcox

SAVANNAH CUP

Falcar	Gelnaw
Falcar	Pearce
Falcar	Hughes
Marmon	Dawson
Marmon	Heinemann
Mercer	Roebling
Parry	
Parry	

TIEDEMAN CUP

Lancia	Knipper
Maxwell	Doorley
Maxwell	Costello
Maxwell	Wright
Cole	W. Endicott
Cole	H. Endicott
E-M-F	Witt
E-M-F	

Conditions of Races

The conditions of the big race are familiar to most enthusiasts. It is to be for the famous gold trophy of the Automobile Club of America, valued at $5,000, now held by the Fiat. The distance will be 412.8 miles, or twenty-four laps around the 17.2 miles course. There is no restriction placed upon the size of cars entered other than that of the overall width of chassis, which must not exceed 68.8 inches. Any size bore and stroke is permitted.

In addition to the gold cup, which goes to the winning entrant, there will be cash prizes awarded to the first three drivers as follows: $4,000 to the winner; $2,000 to second best and $1,000 for third place. A citizen of Savannah has also offered to present $1,000 to the driver of the first American car to finish in the race. Tire and accessory concerns are also offering substantial prizes for winners using their respective equipments. The Bosch Magneto Co. will give $500 to the winner, $250 to the second placed car and $150 to the third placed car.

The Savannah challenge trophy class in the international light-car race, which will start at 9 a. m. Friday, November 11, is open to cars between 231 and 300 cubic inches piston displacement. The distance will be sixteen laps of the 17.2 miles course, totalling 275.2 miles. The Tiedeman trophy division is for cars within the 161-230 cubic inches category. The distance will be eleven laps, or 189.2 miles.

Savannah Has Twenty-three Candidates for Gold Cup—Two Small Events Fill Well

The two classes will be run simultaneously and the cars probably will be started at intervals of 30 seconds. The Savannah challenge trophy has been donated by the city from which it derives its name, while the other prize is the gift of Mayor George W. Tiedeman, of Savannah, who was so largely instrumental in the success of the first grand prize race. In addition to the ornate trophies, the winner in each class will receive an additional emolument of $1,000 in gold. The Bosch Magneto Co. of New York has offered $100 to the winner in each class, providing the victorious car is Bosch-equipped.

The course now is as smooth as an asphalt pavement, there is not a single bump of any size in the whole distance of 17.2 miles. The last finishing touches are now being applied to the grandstand. This will be ready by Monday. All the pits have been dug and the race could be run Monday if it were wished. One of the features of the race, during the grand prize race, will be that the convicts who have done so much and worked so hard to help make the race a success will be given a holiday and let out to enjoy the race that day. The convicts—something like 300—have done good work, and to show their appreciation for their work the county commissioners have granted this request that has come from many.

A new feature that has been added to the grand prize race is that every car that is running at the end of the race will be allowed to finish. This is something that has never been attempted before here and will prove a great help to many cars.

To get good advertisement through the state and bring the people here for the race, on Tuesday last, November 1, the newspaper men were entertained in Savannah by the Savannah Automobile Club. Their time was taken by a ride around the course, a visit to the different camps and a short banquet the following night.

Mayor Tiedeman has issued a proclamation ordering all business houses and banks to close for Saturday November 12, so as to give all a chance to see the racers. Every office in the city will close, as will the postoffice. All in all, the grand prize race this year will attract to Savannah about 150,000 strangers and with its population the attendance should reach the 200,000 mark easily.

First Trial of Course

Savannah, Ga., Nov. 7—Special telegram—Monday's practice brought out several drivers. Arthur Chevrolet made laps in 14 minutes or at 71½ miles an hour. Hemery in Benz made the following time: 16:31, 14:30. Bruce Brown made his fastest lap in 14:38 or at 71 miles an hour. His other laps were 14:51, 15:05 and 14:04. Haupt in the Benz made 14:31, a second slower than Hemery. His other laps were 16:05, 15:01, and 17:22. Grant made 15:40. Sharp made 19:45. Knipper in the Lancia, 18 minutes. Wright in the Maxwell, 21:12, and Doorley Maxwell 20:40.

Fast Time in Practice

Savannah, Ga., Nov. 8—Special telegram—An average of 74.1 miles per hour for one lap was made in practice today by Louis Wagner in Fiat and David Bruce Brown in a Benz. They both completed one lap of 17.2 miles in the remarkably fast time of 13.58. There were the usual number of cars out today—De Palma and Wagner of the Fiat team, Haupt and Bruce Brown of the Benz, Grant of the Alco, Arthur and Louis Chevrolet in Marquette-Buicks, W. H. Sharp in the Sharp-Arrow, Mulford and Horan in Loziers and Matson in a Simplex. Mulford in a Lozier four made the first lap from a standing start in 14:17. David Bruce Brown made his first few laps in 14 minutes and a few seconds. The record, 13:58, was shared by Brown and Wagner. Louis Chevrolet took a turn around the course. His arm still is in bad shape, which will make it impossible for him to drive. It looks now as if Hughie Hughes will complete the Marquette-Buick team for the grand prize. The smaller cars out were the Fal, Mercer and Maxwells.

November 4-12—Ninth international motor show at Olympia, London, England.
November 7-11—Five-day reliability run of Chicago Motor Club, 200 miles a day.
November 10-12-13—Track meet at San Antonio, Tex.
November 11-12—Small-car races and Grand Prix at Savannah, Ga.
November 24—Santa Monica road race, Los Angeles, Cal.
November 19-26—Show at Oakland, Cal., George E. Middleton, manager.
November 26-27—Motordrome meet, Los Angeles, Calif.
December 3-18—Annual salon of Automobile Club of France.
December 25-26—Motordrome meet, Los Angeles, Calif.
December 31-January 7—American Motor Car Manufacturers' Exhibit Association show, Grand Central Palace, New York.
January 7-21—Eleventh national show at Madison Square garden, New York, under the auspices of the Association of Licensed Automobile Manufacturers, 7 East Forty-second street, New York; Merle L. Downs, secretary.
January 14-25—Annual Belgian show, Brussels.
January 14-28—Annual show of Philadelphia Automobile Dealers' Association.
January 15-21—Annual Detroit show.
January 28-February 4—Annual Chicago show of N. A. A. M., pleasure cars.
February 20-26—Show of Omaha Automobile Association at Omaha, Neb.

THREE DOWN FIRST DAY OF CHICAGO RUN

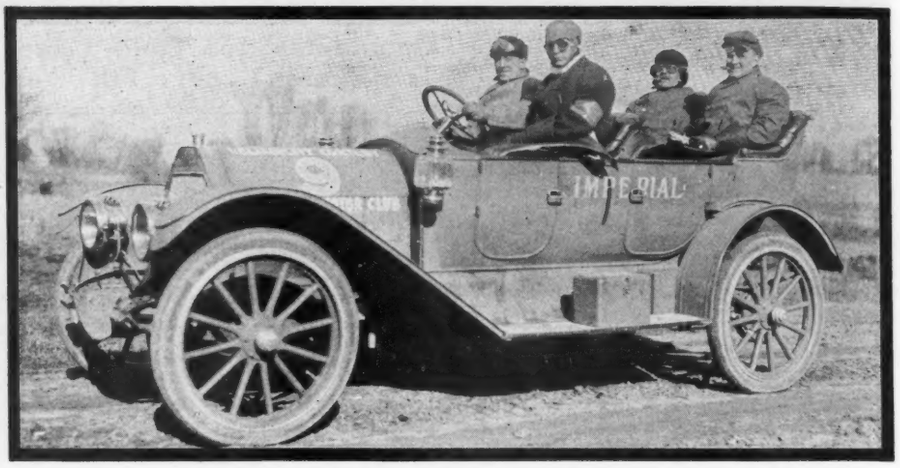
MOLINE, Ill., Nov. 7—Although the 1,000-mile reliability run of the Chicago Motor Club, which started this morning from the Van Dyke garage at 2441 Cottage Grove avenue, Chicago, is the last on the A. A. A. calendar this year, it is one of the most important events of its kind of the season. There are twenty-nine different cars representing nineteen different makers participating in the event, and in addition to the car end of the contest there are other phases which are out of the ordinary. For instance, no other club has ever attempted to pass on the merits of tires as the Chicagoans are doing in this affair, nor do other promoters take gasoline economy into consideration. Also, the local organization has a team trophy which is far from being conventional. The tire trophy is the Branstetter cup, which goes to the tire concern against whose product there are the fewest penalizations. The Standard Oil trophy is to be given to the entrant whose car runs most economically in the fuel way under the formula.

Originally there were thirty-three cars entered for this affair, which requires the contesting machines to travel 200 miles a day for 5 days. Three were scratched this morning however, the two Velies and one of the three Hupmobiles, leaving ten cars running for the Stewart speedometer trophy in the touring car division and nineteen for the Van Sicklen cup in the runabout and toy tonneau class. The run today was from Chicago to Moline, a distance of 186 miles, and the tourists were favored by an almost ideal day. The weather was far from cold despite the fact that November is already one-third gone. The roads were in magnificent shape, all things considered, and it was with the greatest of ease that all the contesting machines reached the night control at Moline well ahead of time. In fact, all of them had checked in by 5 o'clock, whereas the little cars were not due until 6:30.

Despite the good roads encountered today, there were three cars eliminated from the perfect score class, while two others are known to be in such condition that, while they may go through with clean records on the road, they hardly can escape the sharp eyes of the members of the technical committee. Lewis Strang, driving one of the two Cases which are running in the Van Sicklen cup class, had the misfortune to shear a pin off his magneto coupling and he used up 50 points in repairing the damage. Randall, in one of the two remaining Hupmobiles, found the sudden change in the weather too much for his carbureter, and early in the day had to make an adjustment which cost him 1 point. Brown, in No. 1 Abbott-Detroit, became desperate after going 40 miles on three cylinders, and had to adjust a push-rod before things were running smoothly again. This work cost him 3 points penalization.

All through the tour today there was evidence on every side that the residents of the rural districts of Illinois are much alive to the fine points of the modern motor car. Apparently all had been advised that the run was coming their way, for in every town through which the cars passed there were crowds of people gathered on the streets, which displayed an eager interest in the passing of the cars. In several towns, notably Marengo, either the sheriff or the constable was on duty, not to arrest the contestants for scorching, but to show them the way through the town and to urge them to beat it. Possibly the interest was keenest in the small towns, for in places like Elgin and Rockford they are so accustomed to motor cars that the passing of the tour attracted little attention. Rockford was the noon stop, and in honor of the occasion the Hotel Nelson had a special dinner for the motorists at 10:30 a. m., the menu extending from soup to nuts.

Tomorrow the tourists drive from Moline to Quincy, a distance of 167 miles. Wednesday they go from Quincy to Peoria, 205 miles, and on Thursday they travel to Champaign for the night stop, a distance of 215 miles. On Friday the tour returns to Chicago, and on this day the trail will wind through 236 miles of country.



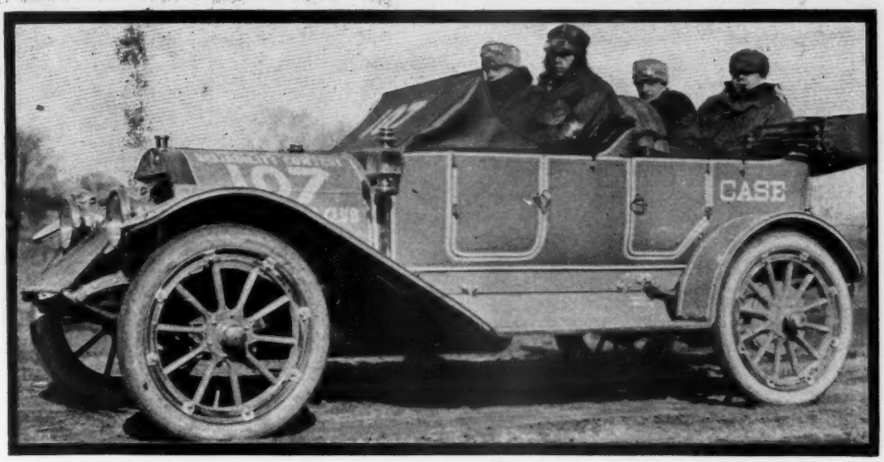
McKERSCHER IN IMPERIAL IN CHICAGO RELIABILITY

WAGNER IN HAYNES IN CHICAGO RELIABILITY

From Moline to Quincy

Quincy, Ill., Nov. 9—The second day's run of the Chicago Motor Club's 1,000-mile reliability proved more disastrous to contestants than the initial day, although only 167 miles and the shortest run of the 5 days. Many of the troubles were due to the rough, hard dirt and gumbo roads. For miles they made every part of the contesting cars vibrate as they traveled over them at 20 miles per hour. In places the holes were nearly 1 foot deep and at others the cross ruts were dangerous. All of the bridges and culverts had 6-inch rises at either side, so that the cars had to come to a standstill almost before crossing them. There were many miles of the road dragged, chiefly between Macomb and Ursa. This allowed of a little speeding, which generally was used to make up time. At Ursa, 12 miles out of Quincy, stone road was encountered, the first of the day, and it was appreciated. Had it rained on today's course

SECOND DAY'S JOURNEY TELLS ON CARS



WALTER JONES IN CASE IN CHICAGO RELIABILITY

it would have been impossible for cars to have averaged more than 10 miles per hour. But nature was kind. The sun shone hot after noon, but worries were started by the ominous black clouds in the west. Happily, the probabilities are "generally fair" and there is every assurance that tomorrow's run of 205 miles from here to Peoria will be over good roads.

Today's run was in strong contrast with that of yesterday's, because it was continuous reception from start to finish. Starting at the small hamlet of New Windsor, the crowd was early on hand and at Henderson, Abingdon and Avon the sidewalks were black with the cheering population. At Bushnell, the noon stop, the entire population was out. During the afternoon there were big crowds at Macomb, Colchester, Plymouth, Bowen, Loraine, Mendon and Ursa. It was a genuine Glidden tour from a reception point of view. The crowds were at every crossroad and not a farm house but had its picnic party on the front porch all shouting good luck to the tourists.

At Quincy the local club, under the presidency of Dr. Williams, was on hand as a reception committee at the hotel. It also furnished music in the dining room and lent its assistance in securing accommodations for many tourists who were supposed to be cared for at the Newcomb hotel, but who discovered that the hotel refused to make reservations for them in advance.

The Quincy chamber of commerce also lent its hand. The hotel has no available rooms for the evening meeting and the 100 tourists went to the chamber of commerce rooms as the guests of that body. The meeting was of the usual nature in which the route and other details of the trip were taken up.

The run today reduced the number of perfect-score cars from twenty-six to nineteen. Three of the contestants have withdrawn from the competition, but will finish the tour. They are the Strang Case, which had clutch trouble today following the magneto disaster of yesterday; the Hearne Hupmobile, which broke a brake rod, and the Krit, which went into the ditch and smashed a wheel. Besides this, the Midland drew 2 points for adjusting the carbureter; the Brush got 8 points for fixing the carbureter; No. 2 Haynes was assessed 8 points through the breaking of a rear axle truss rod; the Cunningham was fined 1 point for tightening the cover of the gearbox, while the Glide was penalized 66 points for work repairing a broken front spring.

From Quincy to Peoria

Peoria, Ill., Nov. 9—Special telegram—Two more perfect scores were eliminated today in the Chicago Motor Club's 1,000-mile reliability run, both of them in the roadster division—Wells' Imperial and the Halladay. The exact number of points against Wells has not been determined as yet. He had rear axle trouble and in addition came into the night control late. For this latter offense he has been handed 4 points, this being the first time penalization handed out since the tour started. The Halladay lost a screw out of the clutch and not having another the driver was forced to use a screw

STANDING IN THE CHICAGO 1000-MILE RELIABILITY

TOURING CAR DIVISION

Car No.	Car and driver	1st day	2nd day	3rd day
1	Abbott-Detroit, Brown	3	0	0
2	Haynes, Irby	0	14	0
4	Cunningham, Emery	0	1	0
6	Halladay, Daubner	0	0	52
7	Haynes, Williams	0	0	0
8	Henry, De Mange	0	0	0
9	Imperial, McKerscher	0	0	0
10	Glide, Cassell	0	66	0
11	Abbott-Detroit, Robbins	0	0	0
12	Cino, Donnelly	0	0	0

ROADSTER DIVISION

100	Falcar, Van Sicklen	0	0	0
101	Midland, Nutting	0	2	0
102	Grout, Halbert	0	0	0
103	Hupmobile, Randall	1	0	..
104	Moline, Van Dervoort	0	0	0
105	Lion, Bloomstrom	0	0	0
106	Moline, Wicke	0	0	0
107	Case, Jones	0	0	0
108	Imperial, Wells	0	0	..
110	Speedwell, La Chappelle	0	0	0
111	Halladay, Aument	0	0	0
112	Staver, Monckmeier	0	0	0
113	Staver, Duis	0	0	0
114	Case, Strang	50	*	
115	Krit, Habernicht	0	*	
116	Brush, Lincoln	0	8	0
117	Haynes, Wagner	0	0	0
118	Hupmobile, Hearne	0	*	
119	Moline, Salisbury	0	0	0

* Withdrawn; running non-contestant

SPEEDWELL, ROADSTER CANDIDATE IN CHICAGO RELIABILITY

taken from the steering column, which cost him 52 points. In addition to these two Randall's Hupmobile will be penalized more. It already had 1 point from Monday, but today it got stuck in the heavy sand near Pekin, 11 miles out of Peoria. It seems to be a question of veracity between the driver and observer, but it is reasonably certain the Hupmobile will get 9 points for taking on water and 5 points for stalling the motor.

With the exception of the sandy stretch at Pekin, today's trip was a boulevard run. Everyone with the exception of Wells reached here well inside the schedule. All along the way there were huge crowds out to watch the tourists pass. It seemed as if the crowds were larger than yesterday, if anything. It is wonderful the amount of interest shown.

It looks threatening tonight and if it rains tomorrow the officials have decided to cut out the extension from Champaign to Danville, which will reduce the day's run from 215 miles to 146.

OBJECT TO CLOSED ROADS

Syracuse, N. Y., Nov. 5—Syracuse and vicinity joins in the statewide protest now being voiced by clubs, in the class press and by newspapers generally against the "Road Closed" signs which all summer long stared tourists in the face as they traveled through the Empire State. "Traveled around" might be a better word, for inasmuch as over 1,000 miles of state road were repaired and oiled this year, any number of detours were necessary. And here arose another grievance, for as John H. Valentine, one of the leading members of the trade in this city put it:

"If in closing roads, the contractors in charge would have signs placed at the first road turning off from where the work is being done, so that motorists would not have to travel a mile or so and then turn around and go back to find a road for a detour, it would help some."

ROBBINS IN NO. 11 ABBOTT-DETROIT IN CHICAGO RELIABILITY

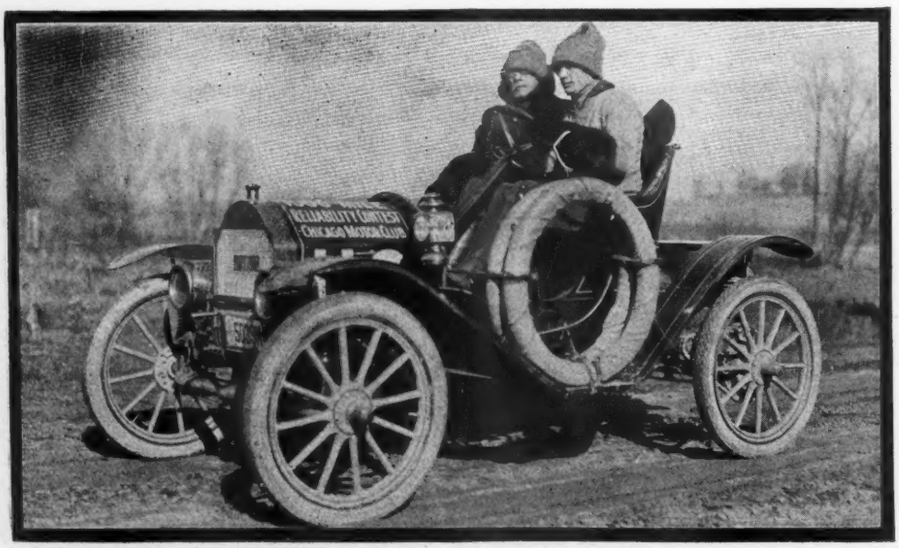
Hoosiers Schedule Good Road Show

INDIANAPOLIS, IND., Nov. 5—The seventh annual convention of the American Road Builders' Association will be held at German house, in this city, on December 6, 7, 8 and 9. In connection therewith will be held a congress of road builders and a good roads show. The sessions of the convention and congress will be devoted to the presentation of a large number of technical papers on the subjects of road and pavement construction and maintenance by leading highway officials, discussions of the papers and of matters pertaining to the work of highway improvement, and to addresses by prominent men interested in, and identified with, the various phases of the work. The program is now being prepared and will be announced later. It will comprise papers and addresses covering every phase of road and street improvement and treating the subject from the viewpoint of each of the many classes to which it is of moment.

The membership of the American Road Builders' Association includes the foremost road-making and street-paving authorities of the United States and Canada —men occupying the chief administrative and engineering positions in the highway departments of states, counties, cities and towns. Following the custom inaugurated last year at the sixth annual convention at Columbus, O., the exhibition of materials and machinery will form an important feature of the convention. Ample exhibition space has been obtained in German house and the grounds connected with it, thus bringing the meetings and the exhibits together and facilitating attendance upon both without the loss of time. The exhibits will include the various materials and the most improved machinery and appliances for road making and street paving. The greater number of exhibits will be shown in the German house, while the larger and heavier machinery will be displayed in the adjacent grounds. The meetings and exhibits will be open to the public and a general invitation is extended to everyone interested in any branch of highway work.

NORTH CAROLINA'S MOTOR ROAD

Asheville, N. C., Nov. 7—The entire western section of North Carolina is interested deeply in the movement which is on foot to build a highway from Asheville to Alta Pass. It is proposed to ultimately extend the proposed motor highway, which will be known as the Ridge road, through western Virginia and on into West Virginia, making a perfect highway about 300 miles long through a piece of mountain country which is unsurpassed in scenic beauty. The road from Asheville to Alta Pass will cost about $75,000, and the legislature will next spring be petitioned for an appropriation for the construction of the road, while the subscriptions will be used for surveys and preliminary work. About $500 of the $600 required for the latter work has been raised. The road was first proposed by Dr. R. Hyde Pratt, state geologist, and the plan was at once adopted by citizens of this section. The road, when completed, will open this vast picturesque section of mountain country which has heretofore been inaccessible. It will pass famous Mount Mitchell, highest peak east of the Rockies, traverse the Black mountain range and the Craggy range.



LINCOLN IN BRUSH IN CHICAGO RELIABILITY

CHICAGO RELIABILITY RUN—THE KRIT RUNABOUT

A. A. A. Is Still After Federal Bill

NEW YORK, Nov. 5—The federal registration bill was one of the things considered at the concluding meeting of the present A.A.A. executive committee, held Wednesday, with President L. R. Speare presiding. Following the executive committee's consideration of the federal bill, Chairman Charles Thaddeus Terry of the legislative board, after a preamble setting forth the extent of the campaign that has been waged for the measure, offered the following resolution, which was adopted:

Resolved, That this association and its various officers, and particularly the legislative board and executive committee, be advised and instructed to make the utmost possible efforts from this date to the adjournment of the next sitting of congress, to secure the enactment into law of the federal registration bill; and

That every state association and its members, and every motor club throughout the country affiliated with the A. A. A., and their members, be called upon and urged to give their immediate and continuous influence and the support to the measure, demand its enactment into law, insist that their representatives in congress not only vote for but work for the measure, and that each and every influence of each and every one of them be invited and employed forthwith and to the end of the sitting of congress, to accomplish the enactment of this measure into law.

Chairman George C. Diehl of the good roads board reported that the highway improvement question never had been in such a healthy condition throughout the entire country. If the fourth national good roads convention goes to Atlanta, Ga., as now appears probable, the south will benefit exceedingly from a gathering certain to be in advance of all preceding similar events. Several innovations are now being planned which will set a new standard for good roads conventions.

The admission to membership of the Motor Touring Club of Jacksonville was accompanied by a statement to the A. A. A. touring information board that that organization was preparing clubrooms to which would be welcome all A. A. A. members who visit Florida. Uptodate information of value will be available to visitors, and it should be kept in mind that Florida is thoroughly awake on good roads, realizing that with their building will come many winter motor visitors.

Reports relating to a recent effort to bring about a so-called Western Automobile Association resulted in the receipt of communications containing assurances of continued loyalty to the A. A. A. Both the Automobile Club of Southern California, with a total membership exceeding 2,200, and the Automobile Club of Utah expressed sentiments of unswerving faith in the A. A. A. plan of government in motoring affairs.

President Speare was empowered to appoint a nominating committee for the annual meeting, which will take place November 30 and December 1 at the Hotel Belmont, New York city.

NEW YORK-SAVANNAH ROADS

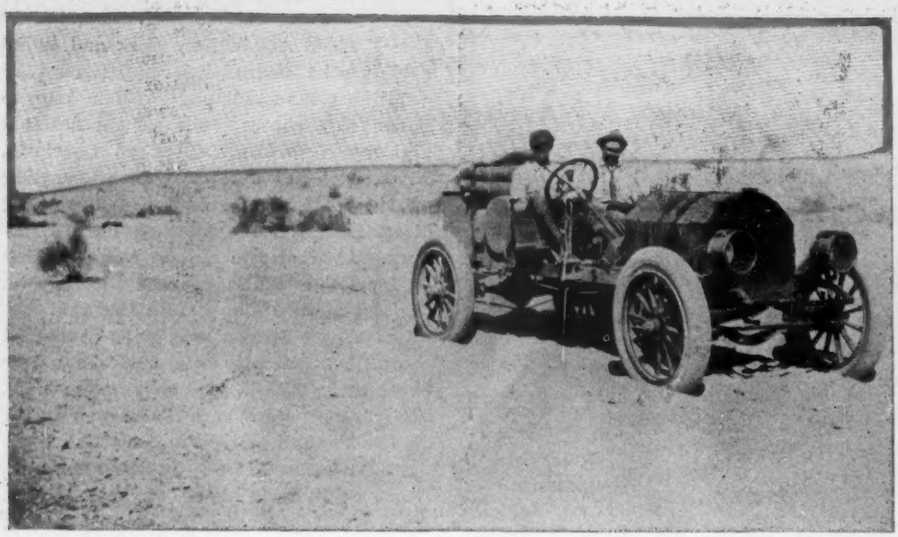
Savannah, Ga., Nov. 5—The growing disposition of motor car manufacturers to spare no pains in attending to the interests of the owners of their product is emphasized here by the presence of an E-M-F 30 which arrived Tuesday from New York. The car came overland from New York, its trip being an informal pathfinding expedition in the interests of a number of E-M-F 30 owners in New York and Philadelphia who desired information on road conditions in contemplation of a trip to Savannah. The car followed the national highway from New York to Charlotte, N. C., with but a few exceptions, cutting off the route to Washington and working direct from Winston-Salem, S. C., to Salisbury. At Charlotte the car struck directly for Columbia and thence to Augusta, the last night's stop before the final destination. No attempt was made at a speed record, but the trip was made in a few hours more than 7 days of running time. The car left New York Tuesday, October 25, at noon and arrived in Savannah Tuesday, November 1, early in the afternoon. Night stops were made at Philadelphia, Pa., Washington, D. C., Staunton, Va., Rocky Mount, Va., Salisbury, N. C., Columbia, S. C., and Augusta, Ga.

In general, road conditions were found extremely favorable for touring. The roughest portion of the trip was, of course, between Staunton and Martinsville, Va., where the route crosses the Cumberland mountains. The car, however, imitating actual touring conditions as nearly as possible, covered practically the entire mountain region in 1 day of running. The scenery of this day's run was magnificent. The roads of North Carolina also show material improvement and the through routes now compare favorably with those of any state in the union.

ANOTHER MAXWELL STUNT

Dallas, Tex., Nov. 5—Sixteen days and nights of continuous running by a Maxwell runabout, without a stop of the motor, was a feature of the Texas state fair at Dallas. Not once did the car require any adjustment or repairs nor was the high gear disengaged from start to finish. The idea of the run was conceived by the United Motor Dallas Co. as a feature of the racing carnival, and it provided a parallel to the 10,000-mile non-stop run by a larger Maxwell car in New England, a few years ago. By covering 3,162 miles during the 16 days, a second member of the Maxwell motor family becomes the rival for the world's non-stop record.

CHICAGO RELIABILITY RUN—THE HALLADAY ROADSTER



HARVEY HERRICK, IN KISSELKAR, WINNER OF DESERT ROAD RACE

Desert Road Race Won by Kisselkar

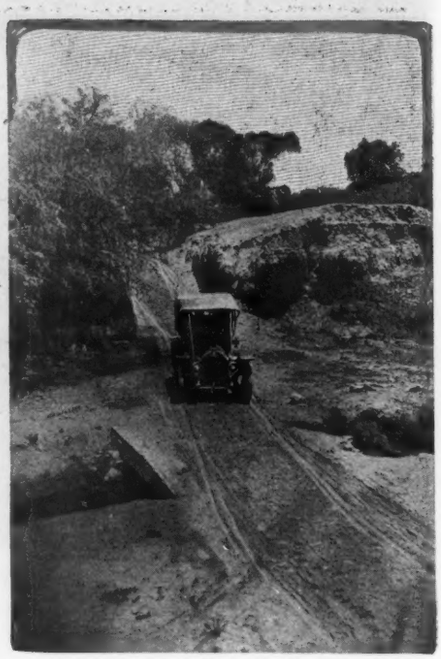
PHOENIX, Ariz., Nov. 7—Special telegram—A Kisselkar 50 with Harvey Herrick at the wheel won the 418-mile desert race from Los Angeles to Phoenix, finishing at 11:12 this morning, the elapsed time being 15 hours and 49 minutes, which is 3 hours 44 minutes better than the winning car of last year. The Franklin six was second in 16 hours 16½ minutes and the Pope-Hartford third in 17 hours 17 minutes.

The race started from Los Angeles Saturday night and the first lap was to the Colorado river, when the cars kept in a control over night. The last leg started at 5 this morning, the cars leaving in the order of their arrival at the river. At 7 tonight eleven of the fourteen starters had finished. The Knox and Maxwell turned back at Mecca on account of trouble and the Abbott-Detroit was delayed at Vicksburg. The race was fairly free from accidents. Mechanic Berry was thrown from the Abbott, but escaped with bruises. Lee Gesricke, of the Apperson, also was thrown out when the seat fell off; he was not hurt.

The Kisselkar took the lead just before reaching Mecca, 150 miles after the start, and was not headed from there on, being first car to leave the river and first to roll in the Phoenix fair grounds. Herrick drove a wonderful race and came far below the generally estimated time. Herrick worked a bit of strategy on the other contestants by taking to the railroad track for 9 miles around a stretch of bad sand beyond Mecca.

Ralph Hamlin made a great drive in the Franklin, climbing up from thirteenth place at the start to second at the river, being 33 minutes behind the leader at the start of the going run and 32½ minutes behind at the finish. Neither the Kissel nor Franklin had trouble of any kind. The Apperson Jackrabbit was 40 minutes behind the Franklin at the river, but lost out badly on the 162-mile run to Phoenix, having seven blowouts. All tires were used up and it was necessary to cut up a casing to make repairs. W. D. Tremain drove his Pope-Hartford from Ehreiburg to Phoenix in 6 hours 3 minutes, the fastest for this lap.

The finish was very spectacular, the Pope flashing into view 5 minutes after the Kissel and the Franklin following in 3½ minutes. Roger Stearns brought a little Ford through in good shape after losing 8 hours on account of a weak wheel, which was replaced before the hard sand was reached. This is the smallest car that ever competed in the race. The Rambler had radiator trouble and lost several hours. The Maxwell turned back on account of carbureter trouble. The Knox was delayed on account of broken springs. Being 4 hours behind at Mecca, it turned back. The start was witnessed by the largest crowd that ever attended a motor event in the west. It is estimated that 100,000 people lined the course for the first 60 miles. The crowd at the start in Los Angeles overwhelmed the police and the cars were forced to go through a narrow lane of people until the outskirts of the city were reached. The roadside was lined with parties gathered around immense bonfires for miles into the country. Summary:



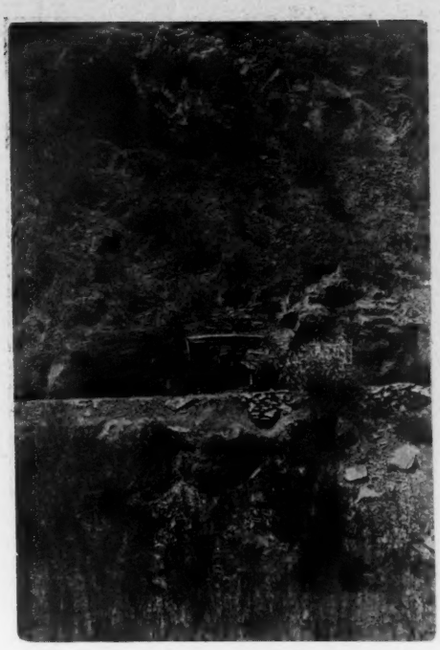
ONE OF THE ARROYOS CROSSED

	Car	Time river	Leave river	Arrive Phoenix	Total time
5	Kissel ...	9:32	5:00	11:13	15:49
13	Franklin..	10:05	5:10	11:21	16:16
1	Pope	11:14	5:15	11:18	17:17
9	Moyer ...	11:50	5:20	12:33	19:03
12	Velie	11:52	5:30	1:32	19:54
4	Parry ...	12:47	5:40	1:16	20:13
3	Duro	12:42	5:35	1:14	20:21
7	Ohio	12:14	5:55	2:15	21:04
2	Apperson.	10:45	5:05	4:21	21:11
6	Rambler .	6:32	5:45	1:03	23:50
11	Ford	20:50	5:55	1:43	28:23
8	Maxwell..	Out			
10	Abbott ...	18:20	5:50		
14	Knox.....	Out			

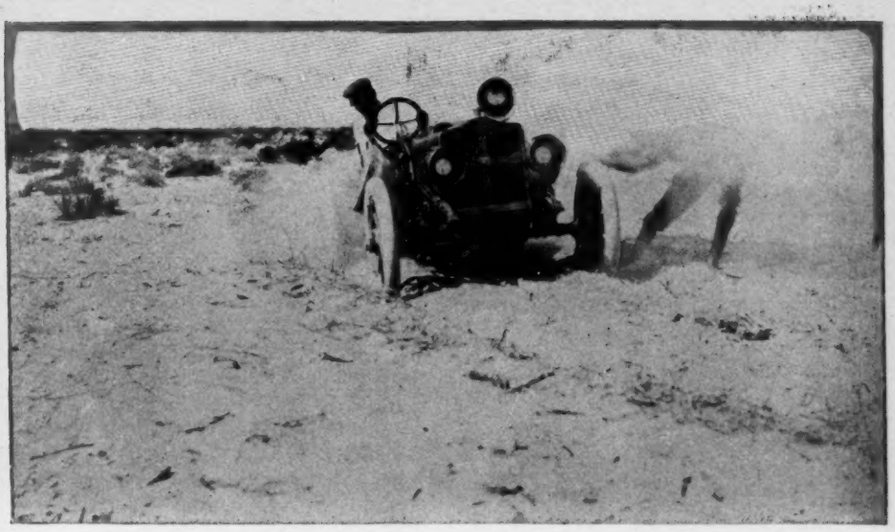
PACKARD HOLDS RECEPTION

Detroit, Mich., Nov. 4—The business men of Detroit were invited to visit the factory of the Packard Motor Car Co. yes-

DROPPING DOWN FROM CATALINA FOOTHILLS IN DESERT RACE



NEAR TUCSON ON THE ROAD RACE COURSE



MAXWELL WHICH PARTICIPATED IN LOS ANGELES-PHOENIX RACE

terday and see for themselves the progress that has been made there during the past 7 years. Over 1,500 of the leading business men of the city attended the reception. The visitors were brought to the factory from the nearest street car lines by a flying squadron of Packard cars detailed for that purpose. The guests were first taken completely around the outside of the plant and down Packard street, a thoroughfare ⅞ miles long, lying entirely within the boundaries of the Packard plant and between the towering walls of the factory buildings. At the entrance of the administration buildings the guests were welcomed by a reception committee and conducted immediately to the offices, where President Joy, Vice-President Waldon and General Manager Macauley met them with a hearty handclasp of welcome. Refreshments were served and the visitors permitted to inspect the plant.

Round-the-World Hupmobile Starts

DETROIT, Mich., Nov. 7—It was a great send-off the populace gave the Hupmobile world tourists, Joseph R. Drake, Thomas M. Hanlon and Tom Jones, Thursday afternoon. The event attracted almost as much attention as the start of the Glidden tour 2 years ago. The crowd began to gather in front of the Hotel Pontchartrain 2 hours before the start and at 2:30, when the tourists took their places in the little car, the streets in the immediate vicinity of the hotel were literally choked with people. Mayor Breitmeyer delivered a graceful farewell speech and presented the tourists with a silken banner, which they will carry throughout the long trip. A party of forty-two visiting dealers from Wisconsin, Illinois and Indiana, headed by W. H. Kane, of the Hearne Motor Car Co., Chicago, acted as escort as far as Chicago, driving an equal number of Hupmobiles. Upwards of 100 Hupmobile owners, driving their own machines, accompanied the party to the city limits.

The dealers arrived in town Wednesday in tow of Mr. Kane. They were shown through the Hupp Motor Car Co.'s plant in the forenoon, and after luncheon were taken to the Packard plant. An elaborate dinner in the evening was followed by a vaudeville program provided by professional talent from the local theaters.

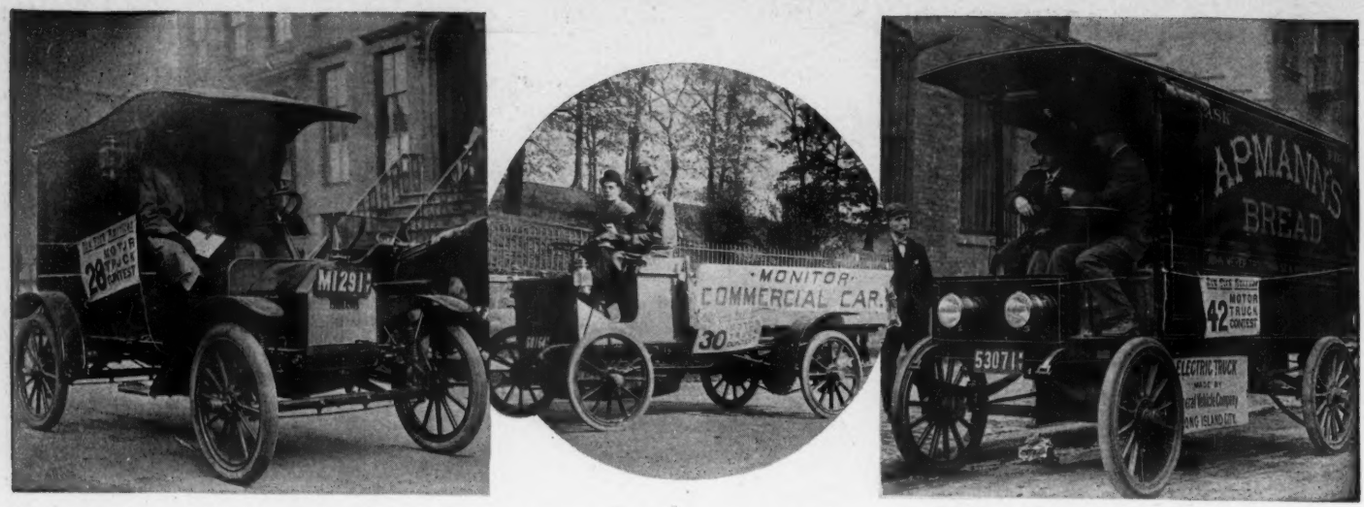
While the crowd was waiting for the start of the world tour, George Miller arrived from the east in his Thomas six, which he was driving from Buffalo to Chicago on high gear. The car attracted much attention and Mayor Breitmeyer congratulated Miller on the fine showing he had made thus far.

The economy test between a Brush runabout and a horse and buggy is progressing finely. On the first day's trial the runabout covered 55.5 miles on a fuel cost of 29 cents, while the horse and buggy covered only 17 miles in the same length of time at a cost of 43 cents for hay and oats. The test lasts 12 days. Needless to say the machine is putting it all over the horse regularly. Wednesday the Brush covered 70 miles at a cost of 36 cents for fuel, while the horse did not better its first day's showing.

Local creditors of the General Motors Co. are receiving checks in settlement of their accounts. The amount of paper held here is said to be about $1,500,000. The payment of these debts is expected to act as a tonic on the local money market. There has been a tendency to tighten up recently.

H. E. Shiland has resigned as general sales manager of the Buick Motor Co. and will go to Saginaw to become general manager of the Marquette Motor Co. Mr. Shiland's resignation becomes effective at once. Mr. Shiland will be succeeded as general sales manager of the Buick Motor Co. by R. H. Collins, of Kansas City. Mr. Collins has been manager of the Buick branch at Kansas City for the last 3 years.

NEAR FLORENCE, ARIZONA, ON ROAD RACE COURSE



BRUSH NO. 28, MONITOR AND NO. 42 GENERAL ELECTRIC IN NEW YORK TRUCK RUN

Engineers Talk Standardization

NEW YORK, Nov. 7—The iron and steel division of the standards committee of the Society of Automobile Engineers met last week at the offices of the society. The division took up consideration of the specifications for materials for motor car construction which had previously been prepared by Henry Souther. As a result of the meeting, the standard form of specimen used in testing materials probably will be changed; and instructions as to the use of the test-specimens and testing-machines will be issued. Specifications for recommendation to the society, of the following steels and irons were taken up in detail and acted upon: .15 carbon steel, .25 carbon steel, .45 carbon steel, .80 and .95 carbon steel, primarily for springs; .20 carbon 3½ per cent nickel steel, .30 carbon chrome nickel steel, .20 carbon chrome nickel steel, .45 carbon chrome nickel steel, .15 carbon chrome nickel steel, .20 carbon chrome vanadium steel, primarily for case-hardenings; .45 carbon chrome vanadium steel, silico-manganese steel, valve metals, steel castings, gray iron castings, malleable iron. The following points will be considered at the next meeting of this division: Pyrometer and heat control, description and definition of heat-treatments, tabulation of physical results of heat-treatments. A standard order of statement of the different elements in the metals will be recommended, something as follows: carbon, manganese, silicon, phosphorus, sulphur, chromium, vanadium.

NEW QUAKER ROW

Philadelphia, Pa., Nov. 4—Market street just east of the Schuylkill river bids fair in the near future to rival North Broad street as a motor car center and the trend westward presages the establishment of a second row. The Woods Electric Co. was one of the pioneers in this regard, having been housed in this vicinity for about a year. While the new building of this company, at 11 North Twenty-first street, still is in an uncompleted state, much of the space has been disposed of; when fully completed the Bartlett building, as the new structure is named, will be the home of

TABULATED SCHEDULE OF RESULTS OF NEW YORK COMMERCIAL MOTOR VECHICLE CONTEST

MANUFACTURERS' CARS—GASOLINE—TRANSFER CLASSES—DIVISION 1—1,000 POUNDS AND UNDER

No.	Car and Entrant	No. of Cylinders or Cells	Gross Weight	Load Carried	Road Penalty	Gasoline Gallons	Oil Pints	Total Costs	Ton Miles	Ton Mile Cost Cents
1	Chase, Chase Motor Truck Co.	3	2,945	1,000	0	11 3-16	4½	$1.9406	65.55	.0296
3	Hatfield, Hatfield Co.	2	3,185	1,000	0	12¼	5½	2.1812	65.55	.0332
2	Hatfield, Hatfield Co.	2	3,010	1,000	0	13½	3½	2.2437	63.55	.0342
4	Brush, John Moore & Co.	1	2,040	600	Disqualified first day, going wrong route					
	DIVISION 2—1,001 TO 3,000 POUNDS									
9	Atterbury, LaDue-Carmer Motor Co.	4	6,630	2,000	0	14½	4¾	2.4718	131.1	.0188
5	Grabowsky, Motor Car Maintenance Co.	2	5,770	2,000	Disqualified second day, taking on lubricating oil					
8	Victor, Victor Motor Truck Co.	4	7,845	3,000	Withdrawn second day, broken steering connection					
	DIVISION 3—3,001 TO 5,000 POUNDS									
12	Kelly, Kelly Motor Truck Co.	4	10,295	5,000	0	15¾	7⅞	2.8234	327.75	.0086
10	Renault, Renault Freres Selling Branch	4	8,182	3,500	0	13¾	7½	2.5312	229.425	.0110
11	Walter, Walter Auto Truck Manufacturing Co.	4	8,070	4,000	Disqualified first day, going wrong route					
	DIVISION 4—5,001 TO 6,000 POUNDS									
23	Alden Sampson, Alden Sampson Mfg. Co.	4	17,200	8,000	0	27	9	4.9825	524.4	.0088
16	Alco, American Locomotive Co.	4	12,810	6,000	0	22¼	10	3.9625	393.3	.0100
19	Grabowsky, Motor Maintenance Co.	2	11,205	6,000	0	24	7½	4.0687	393.3	.0103
22	British Atlas, General Acoustic Co.	4	12,630	6,000	20	25¼	6	4.3625	393.3	.0110
20	Knox, Knox Automobile Co.	4	15,220	8,000	Withdrawn 2nd day, connecting rod bearing burned out					
21	Kelly, Kelly Motor Truck Co.	4	13,365	7,000	Disqualified second day, taking on gasoline					
	DIVISION 5—10,000 POUNDS AND UNDER									
25	Morgan, R. L. Morgan Co.	4	18,920	10,000	0	36½	16	6.4750	661.5	.0097
26	Gaggenau, Benz Auto Import Co. of America	4	23,230	14,000	Disqualified first day, taking on gasoline					
24	Hewitt, Metzger Motor Car Co.	4	33,200	20,000	Disqualified first day, taking on gasoline					

DISTRIBUTING CLASSES. DIVISION 1—1,000 POUNDS AND UNDER

No.	Car and Entrant	No. of Cylinders or Cells	Gross Weight	Load Carried	Road Penalty	Gasoline Gallons	Oil Pints	Total Costs	Ton Miles	Ton Mile Cost Cents
28	Brush, John Moore & Co.	1	1,730	300	0	3 4-5	2¼	0.7209	26.79	.0269
29	Hart-Kraft, Hart-Kraft Motor Co.	2	2,957	500	0	7¾	⅞	1.2015	44.65	.0269
	DIVISION 2—1,001 TO 3,000 POUNDS									
34	Grabowsky, Grabowsky Power Wagon Co.	2	5,010	1,000	0	9	3½	1.5687	89.3	.0175
30	Monitor, Flanagan Motor Truck Co.	2	5,010	1,000	0	14¼	10¾	2.8093	89.3	.0314
7	Cass, Cass Motor Truck Co.	4	4,915	1,000	Withdrawn second day, broken rear wheel bearing					
32	Grabowsky, Commercial Maintenance & Motor Co.	2	4,815	1,000	Disqualified first day, not making required number of stops.					

No. 55 Commercial, No. 48 General Electric and No. 34 Grabowsky, Winners in New York Run

the Woods Electric Co., the Waverly Electric Co. and the Foss-Hughes Motor Car Co. The four-story concrete building of the Autocar Co., another pioneer in the westward movement, at the southwest corner of Twenty-third and Market streets, will be finished by January, at which time the Philadelphia offices of the concern, now at 249 North Broad street, will be moved there. The new structure will have a storage capacity of 300 commercial cars, with ample garage and repair facilities. The Locomobile Co. of America, now at No. 245 North Broad street, has leased for a 10-year period the properties at 2314 to 2322 Market street, where a $100,000 concrete garage, five stories in height, will be erected on a lot measuring 78.6 by 105.10 feet. Others are contemplating moving.

Results of the New York Truck Test

NEW YORK, Nov. 7—Because of the complicated figuring necessary in order to secure the results, the winners in the recent commercial motor vehicle test of the New York American were not announced until yesterday. In the gasoline transfer class the winners were the No. 1 Chase, No. 9 Atterbury, No. 12 Kelly, No. 23 Alden Sampson and No. 25 Morgan. In the distributing gasoline class the Brush and Grabowsky were winners, while in the owners' gasoline class John Wanamaker's Autocar won. Winners in the electric division included three General Electrics and a Lansden. Forty-nine commercial vehicles took part in the test and only six had mechanical troubles. Wanamaker's Autocar distinguished itself by making the run at a cost of 0.100 per ton mile, for which a special prize will be given. A General Vehicle electric motor truck owned by the New York Edison Co. carried 2½ tons at the rate of .004 per ton per mile.

WASHINGTON RESULTS CHANGED

Washington, D. C., Nov. 8—The disqualification of Carter's Washington and Arrison's Washington in the Post run by R. B. Caverly, representative of the A. A. A. has been sustained by the contest board. The award in division 4A goes to Halstead's Washington car, which sustained a penalty of 971 points.

TABULATED SCHEDULE OF RESULTS OF NEW YORK COMMERCIAL VEHICLE CONTEST

No.	Car and Entrant	Cells No. of	Batteries	Weight Gross	Carried Load	Penalty Road	K. W. Current	Costs Total	Miles Ton	Cost Ton Mile
	OWNERS' CARS—GASOLINE—DISTRIBUTING CLASS—DIVISION 2—1,001 TO 3,000 POUNDS									
33	Autocar, John Wanamaker	2	5,370	1,500	0	8½	2	1.3437	133.95	.0100
	MANUFACTURERS' CARS—ELECTRIC. TRANSFER CLASSES. DIVISION 1—1,000 POUNDS AND UNDER									
37	General Vehicle, General Vehicle Co.	66	Edison	4,660	1,000	92	33.5016	2.26006	89.3	.0253
	DIVISION 2—1,001 TO 3,000 POUNDS									
38	General Vehicle, General Vehicle Co.	66	Edison	1,335	3,000	Withdrawn first day, taking on current				
39	Lansden, The Lansden Co.	66	Edison	7,065	3,000	Withdrawn first day, short circuited armature				
	DISTRIBUTING CLASSES. DIVISION 2—1,001 TO 3,000 POUNDS									
44	Lansden, The Lansden Co.	66	Edison	5,210	1,500	0	35.6198	1.4247	133.95	.0106
	OWNERS' DIVISION—ELECTRIC. DISTRIBUTING CLASS. DIVISION 1—1,000 POUNDS AND UNDER									
47	General Vehicle, N. Y. Edison Co.	44	Exide	4,145	500	Disqualified first day, taking on current				
	DIVISION 2—1,001 TO 3,000 POUNDS									
42	General Vehicle, John Meyer	44	G. V.	5,645	1,000	0	24.1218	0.9648	89.3	.0108
40	Lansden, Abraham & Straus	60	Edison	4,945	1,000	0	27.4590	1.0983	89.3	.0123
45	Lansden, R. H. Macy & Co.	66	Edison	5,100	1,000	0	29.5787	1.1831	89.3	.0132
41	General Vehicle, United Electric L. & P. Co.	44	G. V.	5,620	1,000	31	27.8741	1.4249	89.3	.0159
43	General Vehicle, General Electric Co.	66	Edison	5,145	1,000	Disqualified first day, taking on current				
46	General Vehicle, The New York Edison Co.	44	Exide	5,515	1,000	Disqualified first day, taking on current				
	DIVISION 3—3,001 TO 5,000 POUNDS									
48	General Vehicle, N. Y. Edison Co.	44	Exide	8,470	2,000	0	33.8263	1.3530	161	.0084
49	Chicago, Edison Electric Illuminating Co. of B'klyn.	42	Exide	6,520	1,500	Did not finish				
	DIVISION 4—5,001 TO 8,000 POUNDS									
55	Commercial, John Wanamaker	66	Edison	9,225	3,000	0	25.1714	1.0068	207.6	.0048
54	General Vehicle, Borden's Condensed Milk Co.	44	G. V.	11,980	3,500	0	35.7471	1.4298	242.2	.0059
53	General Vehicle, Alex. D. Shaw & Co.	44	G. V.	12,900	3,500	0	40.0331	1.6013	242.2	.0066
56	General Vehicle, United Electric L. & P. Co.	44	G. V.	13,540	3,500	0	40.9450	1.6378	242.2	.0067
50	General Vehicle, New York Edison Co.	44	Exide	12,975	3,500	0	42.813	1.7125	242.2	.0070
51	General Vehicle, P. Daussa & Co.	44	Philad'a	11,332	3,000	Disqualified first day, taking on current				
52	General Vehicle, Central Brewing Co.	44	Exide	11,115	3,000	Disqualified first day, taking on current				
	DIVISION 5—10,000 POUNDS AND OVER									
58	General Vehicle, Edison E. I. Co. of Brooklyn	44	G. V.	14,660	5,000	0	30.2612	1.2104	297	.0040
36	General Vehicle, New York Edison Co.	44	Exide	15,950	5,000	0	40.7440	1.4816	297	.0049
57	General Vehicle, Central Brewing Co.	44	Exide	14,600	5,000	0	Motor broken			

SMALL BORE POPULAR WITH FRENCH MAKERS

Apparently there is Unanimity of Opinion in Favor of 3.1-inch Used by Constructors in Models for 1911

PARIS, Oct. 27—The unanimity with which French motor car constructors have fixed on 80 millimeters—3.1 inches—as the popular bore for next season's models is really remarkable. To give instances: Panhard will have three distinct models, of respectively two, four and six cylinders, all with a bore of 3.1 inches, these three types comprising the majority of the firm's output. Renault has three models with this bore; the most popular Darracq line is a four-cylinder car with 3.1 inches bore, the six-cylinder car with the same bore being shown as the firm's model de luxe; Brasier has added a 3.1-inch bore car to his list and will make it his most important item of production. Gregoire will produce nothing but 3.1-inch bore cars, varying, however, in the number of cylinders and in the length of the stroke.

If there is unanimity on the bore of the cylinders, there is a divergence of opinion regarding the length of stroke. Panhard, Renault, Darracq and many other of the large firms have fixed upon 4.7 inches, giving a ratio of 1.5 to 1. The younger and less conservative firms have exceeded this, several of them going as high as 6.2 inches stroke, or a ratio of 2 to 1. Constructors have been led to these dimensions by the experience gained with long-stroke racing motors, and by the fact that taxation in both France and England is based on bore alone. It is thus a distinct advantage to the customer to be able to present a motor with the very moderate bore of 3.1 inches, rated and taxed at only 12 horsepower, which by reason of its long stroke, big valves, high speed and other structural features will really develop 30 or more horsepower.

Gregoire Interesting Type

An interesting example of this type of motor is to be found in a new product of the Gregoire company: bore 3.1, stroke 6.2, rating in France 12 horsepower, rating in England 15 horsepower, actual horsepower 30, speed with full touring body 60 miles an hour. When each horsepower costs a dollar it is advantageous to possess 30 and only pay taxes for 12.

The Gregoire has its cylinders in two castings, valves on one side, of large diameter, operated from below, and with enclosed stems, according to the now common practice. The magneto, a high-tension Bosch, is on the valve side of the motor, with the carbureter on the opposite side, the intake manifold being cast with the cylinders, the intake piping being connected at a point near the lowermost front corner of the waterjacket. Cooling is by thermo-syphon, with a fan back of the gilled tube radiator. As on all the Gregoire models, lubrication is of the force feed type, a pump worked off the camshaft carrying oil from the crankcase base to the main bearings. This model, contrary to the others, has not a bored crankshaft, the lubricant being supplied to the three crankshaft bearings and directed in a stream on each of the connecting rod ends, then passing through a fine gauze filter into the base chamber.

Silent Chain Runs Camshaft

A new feature, and one that appears likely to have an extended application, is the use of a Renolds silent chain for driving the camshaft and the magnetoshaft. The single chain engages the three pinions on mainshaft, camshaft and magnetoshaft and has an eccentric adjustment to take up slack due to wear. Except that four speeds are now fitted in place of three, the chassis has not undergone any serious change. Four-speed gear boxes, by the by, are becoming very much more popular for all but the cheapest series of cars. On the Gregoire the clutch is of the cone type, final drive by propellershaft, without a torque rod, and rear springs of extra-long three-quarter elliptic type. Wheelbase is 123 inches; either wire or wood wheels are fitted. In addition to this long-stroke motor Gregoire will continue the production of a two, four and six-cylinder car—3.1 by 4.7-inch bore and stroke in all cases.

Another interesting example of the desire to increase power without adding to the size of the motor is to be found in the new Darracq of 3.1 by 4.7 inches bore and stroke. When first produced the motor had 85 millimeters bore, but the odd 5 millimeters were quickly knocked off to bring the motor in the 4 guineas taxation class. This model made a sensation last year by reason of its low price, and created interest among engineers by reason of its special Arbel frame composed practically of a single stamping with the exception of four transverse members.

The chassis remains as before, but in order to meet the public demand for higher motor efficiency, the engine has been entirely re-designed. It now has its cylinders in two castings, has superimposed valves, the intake being above the exhaust and operated by overhead rockers, a ball-bearing crankshaft, and a crankcase divided vertically instead of horizontally. In making these changes on the motor there appears to have been some copying of Sizaire design, for this firm probably was the first in France to adopt a cast steel crankcase divided vertically into two equal portions, with a large ball bearing for the crankshaft in the extremity of each half. By superimposing the valves, instead of having them side by side, Darracq has been able to increase their diameter and to modify the intake and exhaust passages in order to obtain a much freer entrance and exit of the gases. Whereas the old motor was rated 14-16, and certainly did not exceed this latter denomination, the new one maintains 18 horsepower on the bench without difficulty. The use of ball bearings on the crankshaft has entailed changes in the system of lubrication. It now is entirely by splash, the oil being drawn by a pump working off the extremity of the camshaft from a tank on the front of the dashboard and delivered to the crankchamber after passing through a sight feed on the dash. The timing gears are supplied with lubricant through a filler mounted on the case. A feature of the valve-operating mechanism is that the overhead rockers are not placed at right angles to the camshaft, but parallel with it, the adjustable pushrods being at the outside of the two-cylinder blocks; this valve design makes cylinders in pairs almost a necessity in order to allow space for the passage of the two central pushrods.

Single-Jet Carbureter

In its main features the carbureter has not been changed. It is of the single-jet type, with a vertical nozzle, around which is fitted a plain tube connecting directly with the intake manifold. The tube is in two portions, the lower part having a length of a couple of inches, drilled to admit the primary air, and screwing into the main portion of the tube. This latter in turn screws into the intake manifold, and in doing so screws out of the lower extremity with the air holes, thus allowing for dismounting over the vertical nozzle. The additional air is admitted in a chamber attached to the center of the intake manifold, this chamber also containing the throttle, operated by accelerator pedal only. The design of the intake piping is one that is common to several simplified French cars, notably Charron.

Last year plain bearings were employed in the front road wheels and the rear axle of the 14-16-horsepower model. For the 1911 season ball bearings will be employed throughout. It has not been possible to make these improvements without an increase in the price of the car.

In common with a large number of French firms, Darracq also is producing a six-cylinder model for 1911, the dimensions of which are the same as for the 15-horsepower four, namely, 3.1 by 4.7 inches bore and stroke. The cylinders are in two castings of three, with exactly the same valve design as on the four-cylinder model. Here, however, there is a central bearing, and all three are plain. The crankshaft is divided horizontally, as in the majority of multi-cylinder cars. Both intake and exhaust manifolds are cast integral for each bloc of cylinders, the exhaust being directed downward at the base of the valve chamber, and the intake being at the

LATEST IDEAS IN DESIGN ON THE CONTINENT

Features Brought Out for Next Year by Panhard, Darracq and Others—Pony Runabout Makes Hit in Paris

extreme upper portion. The intake pipe is in the form of a Y, the stem of which received the carbureter, while each of the arms are connected up to the intake manifolds. Additional air is admitted, and throttling takes place, in a chamber at the angle formed by the two arms.

New Darracq Four-Cylinder

In addition to these two models, Darracq will have a new production in the form of a four-cylinder monobloc of 2.6 by 4.7 inches bore and stroke, rated at 8 horsepower, and having a two-seated body. This is the smallest four-cylinder model ever produced by the Darracq factory. A distinctive feature will be the use of a combined frame and body, each of the side members being stamped out with a part of a bucket seat. The idea is one that was taken up by Darracq about 3 years ago for a single-cylinder model that has since been abandoned.

There is a pronounced tendency on the part of French constructors toward the production of small six-cylinder cars, that is, cars with a bore of not more than 3.1 inches, and in many cases being as low as 2½ inches. The object is to produce a silent, exceedingly flexible motor, of restricted area, suitable for a car to be used primarily for town service. Very few really big six-cylinder cars will be built, while such firms as Panhard, Renault, Delahaye, Delaunay-Belleville, Delage, Charron, Darracq, Clement-Bayard and Sizaire-Naudin have new sixes of 3 inches bore or less. The more important of these firms have built big sixes for some time, but the demand for them is very small. The less important firms have previously devoted their attention to single and four-cylinder models only. Important among these are Sizaire-Naudin, which has created a reputation for one-lungers and more recently has produced an original type of four. It now is following this up with a small six of only 2½ inches bore. Delage is another small-car builder having secured a reputation for highly-efficient single and monobloc four-cylinder motors, who now for the first time produces a six.

Six in Monobloc Form

In accordance with his general practice, Delage builds his six in monobloc form, with cylinder dimensions of 2½ by 4.9 inches—66 by 125 millimeters—being a ratio of practically 1.9 to 1. Valves are all on one side, operated by a single camshaft, and although the motor is decidedly compact, they have a diameter of 32 millimeters, or only 1 millimeter less than half the cylinder bore. On all his four-cylinder models Delage has avoided the use of a central crankshaft bearing on the ground that, unless it is of extraordinary length it is quickly ovalized and becomes utterly useless as a support. In view of the length of the shaft, however, he has not dared to use two bearings only, and has fitted a central ball bearing of such large diameter that it practically fills the whole of the center of the crankcase. The margin of safety is so great that the central ball bearing should long outlast the plain end bearings, although these are of liberal length.

The Delage six certainly is one of the cleanest-cut motors to be found on the French market, intake and exhaust manifolds being cast integral, and the water pipes being an integral part of the bloc. Special care has been taken, and numerous experiments carried out, in order to obtain a diameter and shape of intake and exhaust manifolds which would not restrict the power of the motor. The intake manifold, for instance, is not of uniform diameter throughout, but varies in size and shape for nearly every cylinder, in order that the charge may be aspired with the least possible resistance. Delage attributes the high-power obtained with this motor to this feature alone. During the bench tests it never fell below 28 horsepower for 10 consecutive days, running 10 hours a day at 1,800 revolutions a minute, which is the normal speed. Accelerated to 2,000 revolutions a minute, the motor easily gives 30 horsepower. Lubrication is by force feed by means of a pump worked off the camshaft, the oil being drawn from the crankcase base, delivered to the main bearings and through the hollow shaft to the connecting rod ends. The filler is on the left-hand side of the motor, just ahead of the rear arm. The cover has a graduated stem descending to the base of the oil tank, thus serving to indicate not only the amount of oil available but the quantity required to obtain the necessary level. A modified Claudel carbureter is used. Ignition is by Bosch magneto, with fixed advance. The wiring is very neatly arranged, the six cables being passed through a hole provided for them in the outlet water pipe on the head of the motor to the plugs carried directly in the head of the cylinders. There is only one valve plug per cylinder, in the center of which the spark plug is mounted. The starting crank is entirely mounted within the crankchamber and not on the car frame. Timing gears are encased at the front, and valve stems are enclosed by a single plate.

Chassis features of the Delage six are not very distinctive. A multiple-disk clutch is employed, the disks all being steel, a selective three-speed gear box is fitted, and final drive is by propellershaft. Suspension is by long semi-elliptic springs and radius rods are fitted. Generally the car is supplied with a two-seated torpedo body, the wheelbase of the car being 110 inches.

Sizaire-Naudin always has been characterized for original lines, first in the production of long-stroke single-cylinder and later in four-cylinder cars selling at low price. Their changes for the coming season comprise a four-cylinder motor of 2.7 oy 5½ inches bore and stroke, and another model with the same bore and a stroke of 6.69 inches. This latter gives a ratio of 2.4 to 1 stroke to bore and probably will be the highest adopted for a standard type of car. The motor in each case is a monobloc, with the cylinders mounted on a crankcase divided vertically into two equal portions, and the crankshaft carried on two large ball bearings. On the latest models a double race of ball bearings has been fitted, in place of the single race at first used. Valves are superposed, the intakes being operated by rocker arms on a system long adopted by the firm for all its one-cylinder models. Water circulation is by thermo-syphon, with a plain tube radiator, the tubes of which, on the latest model, are arranged in a series of V's in order to offer a bigger surface to the passage of the air.

Three Direct Drives

As formerly, there are three direct drives, by means of spur gears, the propellershaft having a lateral movement obtained by the action of a large bronze cam, and a longitudinal movement provided for by a telescoping shaft. The changes are the fitting of ball bearings throughout in the rear axle, and the abolition of the brake within the rear axle pinion. The two brakes are side by side on the rear drums, one set being operated by the clutch pedal, and the other by side lever. For the former set a stout stranded wire cable is employed, the two extremities being received in the brake levers, and the loop passing round a bronze pulley on the clutch lever. The adjustment is such that on a slight depression of the pedal the clutch is disengaged, and a further depression applies the brakes. The endless cable passing round the pulley gives an automatic balancing of the two brakes. Contrary to the general tendency, elliptic springs are used in place of semi-elliptics formerly employed, and the chassis is one of the few with armored wood frame. For the first time Sizaire-Naudin will produce a six-cylinder of 2.7-inch bore for the Paris salon.

Hotchkiss has this year confined changes to a few details only. The two smallest models of 3.1 by 4.7 and 3.7 by 4.3 inches bore and stroke have en bloc cylinders with valves on one side. All the other models have cylinders in pairs. It is interesting to note that Hotchkiss, who introduced ball-bearing crankshafts a few years ago, only to quickly abandon them, still sticks to plain bearings despite the very strong tendency this year toward the

use of balls. The crankcase is open at one end only, the shaft being passed in from the rear. It has been decided that all models shall be fitted with four-speed gear boxes instead of three, this also being in accordance with a strong European tendency. The clutch is of the standard cone type, but now is enclosed. The rear brake drums, on the other hand, are left open, the factory declaring that when they are enclosed dust enters and they are never cleaned out.

Little Bugatti a Surprise

A car which will attract a lot of attention at the Paris salon is the little Bugatti runabout. The idea of the designer is to produce a high grade car, a car that will stand comparison with the product of the best factories, and which will be as fast as any genuine touring car on the road. Obviously such a car cannot be produced at a low price, and never will be a competitor with the many serviceable low-priced cars now built in series. Bugatti's appeal is made to rich owners, men who already have one or more large cars and will purchase a mechanical pony—as he terms it—fully as fast as the big cars, and infinitely more handy when only one or two persons have to be carried.

The Bugatti is a comfortable two-seater with a wheelbase of 79 inches, tread 43 inches and weight empty, with tanks filled, 793 pounds. At the Gaillon hill-climb, with two passengers, its official weight was 1,181 pounds. On catalog rating the motor develops 5½ horsepower; but this is a conservative estimate, for although its cylinder dimensions are only 2½ by 4.3 inches bore and stroke, it has been designed to run normally at 2,300 revolutions a minute, and to accelerate to 3,800 revolutions. It is a monobloc construction, with the cylinders bolted to an aluminum crankcase, the arms of which are attached direct to the frame members, and the crankshaft carried on two large ball bearings. Obviously, in view of the high speed at which it is intended to run, the reciprocating parts are as light as possible, the pistons being machined out of the steel bar and the connecting rods tubular. The valve mechanism is overhead, the camshaft being carried in a bronze housing bolted onto the head of the cylinder bloc, and driven by vertical spindle and bevel gearing. The valve stems are vertical, and not inclined, as is usual in this design, while their diameter is made as large as possible. The exhaust is on the left-hand side, with a separate port from each cylinder, the intake being on the right-hand side, with two arms passing from the mixing chamber in the head of the carbureter. A novel feature is that the primary air intake pipe is passed through the motor block, that is between the base of the second and third cylinders, its open end being in close proximity to the four exhaust manifolds where they join the straight length of exhaust piping connecting up to the silencer.

Ignition is by high-tension magneto with variable advance, the magneto being carried across the motor, its drivingshaft also operating the centrifugal water pump. A honeycomb type of radiator is employed. Lubrication is entirely by splash, with two sight feeds on the dash, as is common with motors having ball bearing crankshafts. The gasoline and oil tanks are built into the dash in the Delaunay-Belleville manner. A disk clutch with steel and cast-iron plates takes the drive to a remarkably small four-speed gearbox with selective change. The change-speed sector, which is mounted on a transverse tube, and is within the frame, is one of the neatest and certainly the smallest yet produced, its overall area being 2 inches by 1½ inches. The transverse tube, within which is mounted the gear-shifter, forms the sector, for it is cut open longitudinally for a length of 2 inches, and in this longitudinal opening carries the six notches corresponding to the ahead and reverse gears and the neutral position. A full floating type of rear axle is employed, with a torque stay of channel section, triangular shape, and made of pressed

Old A. L. A .M. Officers All Returned

NEW YORK, Nov. 5—For the seventh time Charles Clifton was unanimously elected president of the Association of Licensed Automobile Manufacturers, at the largest yearly gathering ever held by that organization. Representatives were present from almost every factory in the A. L. A. M. when the meeting was called to order at the association headquarters in New York Thursday.

In recognition of their services during the past year, the board of managers of the association returned to office by unanimous vote every official who served during the past year, and passed a vote of appreciation and endorsement of their guidance and work. These included the following: President, Charles Clifton, Pierce-Arrow Motor Car Co.; vice-president, S. T. Davis, Jr., Locomobile Co. of America; secretary, L. H. Kittredge, Peerless Motor Car Co.; treasurer, George Pope, Pope Mfg. Co.; general manager, Alfred Reeves; executive committee, Charles Clifton, Pierce-Arrow Motor Car Co.; S. T. Davis, Jr., Locomobile Co. of America; Thomas Henderson, Winton Motor Carriage Co.; Hugh Chalmers, Chalmers Motor Co.; Herbert Lloyd, Columbia Motor Car Co.

At the meeting of the Association Patents Co., held later in the day, which is a subsidiary corporation of the A. L. A. M., and which owns or controls patents in connection with the construction of motor cars other than the fundamental Selden patent, the following officers and directors were unanimously elected: President, Charles Clifton, Pierce-Arrow Motor Car Co.; vice-president, Thomas Henderson, Winton Motor Carriage Co.; secretary and treasurer, Alfred Reeves; directors: George Pope, Pope Mfg. Co.; I. H. Page, Stevens-Duryea Co.; L. H. Kittredge, Peerless Motor Car Co.; Hugh Chalmers, Chalmers Motor Co.; R. E. Olds, Reo Motor Car Co., and Hermann F. Cuntz, on patent matters.

There was a discussion of trade conditions, which, from reports, appear to be even more healthy than at this time last year, and it was noted that the increase in the motor car business during the past 12 months was almost 100 per cent, a record that has no comparison in any other line of trade. It was agreed that a conservative policy with increased care in the manufacturing and marketing of cars was the best procedure for the 1911 trade. There are now some 6,500 dealers handling the products of the licensees under Selden patent No. 549,160.

Chairman Pope, of the show committee, reported on progress being made in connection with the 2 weeks show which opens in Madison Square garden.

A resolution was passed with a view of having the Licensed Dealers' Association of New York coöperate and affiliate with the manufacturers in the national show, although the promotion and management of the garden shows remain, as in the past, with the A. L. A. M.

PHILIP CORBIN DEAD

New Britain, Conn., Nov. 4—Philip Corbin, president of the American Hardware Corporation and founder of P. & F. Corbin, died at his home in New Britain, Conn., on Thursday, November 3, aged 86 years 8 days. The funeral services were held at his late residence, 64 Maple street, Monday. He was interred in the family lot in Fairview cemetery. Mr. Corbin's outside business interests were not many, as he preferred to give all his time and attention to the companies created by him. He was, however, at the time of his death, president of the New Britain Machine Co., the Porter & Dyson Co., the Savings Bank of New Britain, the Calumet Building Co., the D. C. Judd Co., the H. R. Walker Co., and the Whiting Land Co. On June 11, 1903, the manufacture of motor cars having been favorably considered, the Corbin Motor Vehicle Corporation was incorporated.

MORE SELDENITES CREATED

New York, Nov. 7—Announcement is made that the R. L. Morgan Co., of Worcester, Mass., manufacturer of the Morgan truck, the Daimler Import Co., of New York, importer of the Mercedes car, and the Hotchkiss Import Co., of New York, importers of the Hotchkiss car, have been granted licenses under the Selden patent, and the cars have been allotted space in the Madison Square garden show.

steel.

The maker claims 60 miles an hour on the open road, and the claim appears to be justified, for the little car certainly holds the road well at high speeds. In tests made around Paris, over roads abounding in pot holes and rough pavé, we were able, on the Bugatti, to keep pace with a 4 by 6½-inch Prince Henry Benz with special torpedo body driven at the highest speed at which it could be expected to hold the road. And, contrary to which might be expected, we were no more shaken in the little short-wheelbase car than were the occupants of the big semi-racer. In city traffic the Bugatti is as handy as a bicycle and it was maneuvered very easily through the congested section of the city, the driver having no trouble whatsoever.

For the Paris salon the maker of this car will have the same motor on a longer chassis carrying a four-passenger body. On the same chassis he will have a very low berline or inside steering body, built entirely of aluminum, and which he claims will be the lightest body ever produced. The car is produced at Molsheim, in Alsace, Germany.

Roman Idea for the Garden Show

NEW YORK, Nov. 7—There will be many features at the eleventh national show, to be held in Madison Square garden January 7 to 21, to hold the attention of those who have little or no interest in motor cars or motoring things in general. This is true of the decorations in particular, which this year will be more magnificent and more costly than ever before. The show committee already has decided upon a setting for the exhibits, but because of several minor changes the scheme of decoration will not be made known until later. The committee and W. W. Knowles, the architect in charge, have carefully considered every nook and cranny of the big show building and an idea of uniformity will be carried out so completely that the small spaces in the galleries, basement and in the halls will receive the same attention as those on the main floor.

One of the novel decorative features of the show will be found in the exhibition hall, which is to be transformed into a veritable Roman garden. Here the cars will be displayed under a big pergola, 20 feet wide, which will extend about the interior of the room. The pergola, supported by twenty-five massive Doric columns, will be covered with vines of wistaria which will trail about the columns and be entwined about a number of lattice lanterns hung from cross-beams. In the center of the room will be six lattice standards, or pylons, each topped with a slanting roof from the corners of which colored electric lamps will hang pendant. The center of the hall will be open and uncovered except for a sky of azure blue canopy which will top the entire hall, giving it a real outdoor appearance.

From behind a balustrade, which will extend about the room back of the pergola, the visitor can feast his eyes on a scenic painting which is to run the entire length of the four walls of the room. The painting will depict a picturesque section of the famous Route de la Corniche, better known to tourists as the Riviera, a roadway which extends from Genoa, Italy, to Marseilles, France. Motorists who have traveled over it proclaim the Riviera to be the grandest route for scenic splendor on the continent. Jean Palelogue, the artist who is executing the painting, spent much time in Europe, getting material for this gigantic scene, and he will feature on the canvas the most picturesque bridges, castles, mountain passes and many of the ancient Roman ruins which dot the roadway at intervals. The floor will be covered with green carpet, which will give the cars an appearance of reposing on grass.

PALACE SHOW EXHIBITORS

New York, Nov. 5—Names of forty-three manufacturers of pleasure and commercial motor vehicles who will exhibit in the independent show which will be held in the Grand Central palace the week of December 31-January 7 have been announced. The list is as follows:

Abbott Motor Co., Detroit, Mich.; American Motor Truck Co. of Michigan, Detroit, Mich.; Atterbury Motor Car Co., Buffalo, N. Y.; American Motor Truck Co., Lockport, N. Y.; H. H. Babcock Co., Watertown, N. Y.; L. J. Bergdoll Motor Car Co., Philadelphia, Pa.; Carhartt Auto Corp., Detroit, Mich.; C. S. Baeder, Lexington Motor Car Co., New York; Car Makers Selling Co., Chicago; Chase Motor Truck Co., Syracuse, N. Y.; Chicago Pneumatic Tool Co., Chicago; Cortland Motor Wagon Co., Cortland, N. Y.; Clarke-Carter Auto. Co., Jackson, Mich.; Columbus Buggy Co., Columbus, O.; Demot Car Sales Co., Detroit, Mich.; Fal Motor Car Co., Chicago; F-Z-H Parts Co., Chicago; Findlay Motor Co., Findlay, O.; Gramm Motor Car Co., Bowling Green, O.; Harry S. Houpt Mfg. Co., New York; Imperial Auto Co., Jackson, Mich.; Johnson Service Co., commercial, Milwaukee, Wis.; Johnson Service Co., pleasure, Milwaukee, Wis.; Kelly Motor Truck Co., Springfield, O.; Krit Motor Car Co., Detroit, Mich.; Lion Motor Car Co., Adrian, Mich.; Metz Company, Waltham, Mass.; Martin Carriage Works, York, Pa.; Michigan Buggy Co., Kalamazoo, Mich.; New Haven Truck and Auto Works, New Haven, Conn.; Albert L. Otto, Saurer truck, New York; Owosso Motor Co., Owosso, Mich.; Parry Auto Co., Indianapolis, Ind.; W. A. Paterson Co., Flint, Mich.; Pennsylvania Motor Car Co., East Liberty, Pa.; Penn-Unit Car Co., Allentown, Pa.; J. M. Quimby & Co., Isotta, Newark, N. J.; Roader Car Co., Brockton, Mass.; Scioto Auto Car Co., Chillicothe, O.; Spencer, Llaana Brener Co., New York; Staver Carriage Co., Chicago; Warren Motor Car Co., Detroit, Mich.; West Side Garage and Motor Co., Seitz motor, New York; Whiting Motor Car Co., Flint, Mich.

EXPORTS AND IMPORTS

Washington, D. C., Nov. 4—No branch of the American export trade is growing with greater rapidity than the foreign trade in motor cars and parts. The latest returns show that during September last 502 motor cars, valued at $607,258, were exported, together with $137,438 worth of parts, not including tires. In September a year ago the number of cars shipped abroad was 286, valued at $373,754, while the value of the parts exported, not including tires, was $91,658. During the 9 months' period ended September, 1910, the number of cars exported was 6,469, valued at $8,874,066, together with parts valued at $1,545,933, which does not include tires. During the corresponding period of 1909, the number of cars exported was 3,426, valued at $5,481,707, while the exports of parts, not including tires, were valued at $618,150.

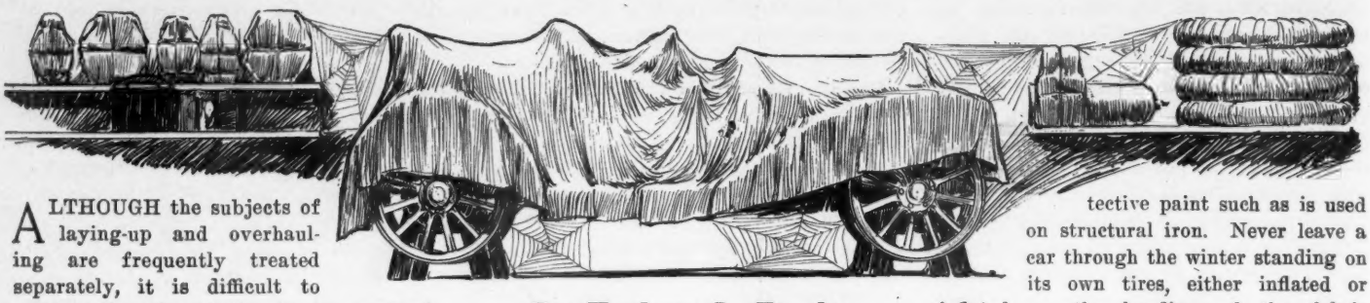
The exports of cars and parts during September last were as follows: United Kingdom, $96,029; France, $46,122; Germany, $14,976; Italy, $5,956; other European countries, $27,518; Canada, $248,232; Mexico, $67,933; West Indies and Bermuda, $21,107; South America, $15,296; British Oceania, $71,727; other Asia and Oceania, $105,071; all other countries, $24,729.

The import trade in motor cars continues to drop, the latest returns showing the imports fell from 150 cars, valued at $291,811, in September, 1909, to eighty-six cars, valued at $179,269, in September last. Imports of parts, not including tires, dropped from $80,400 to $34,175 during the same period. During the 9 months' period the imports of cars fell from 1,208, valued at $2,218,414, in 1909, to 809, valued at $1,623,140, in 1910. The imports of parts likewise declined in value from $656,371 to $591,780 during the same periods. The imports of cars, by countries, during September last were as follows: United Kingdom, twelve, valued at $23,473; France, forty, valued at $90,816; Germany, nine, valued at $21,878; Italy, sixteen, valued at $22,239; other countries, nine.

VERIFIES GUAYULE STATEMENT

Washington, D. C., Nov. 7—Robert W. Dowe, United States collector of customs for the ports on the Mexican border between San Antonio and El Paso, Tex., verifies the statement of Consul L. T. Ellsworth of Ciudad Porfirio Diaz in Daily Consular and Trade Reports, of August 13, regarding guayule rubber shrub supply in this consular district by saying: "Most of it is being used by the American manufacturers of motor car tires. A number of big guayule factories in Coahuila and Chihuahua are working night and day. It has been estimated that the value of the guayule shrub now standing on the lands of Coahuila is $65,000,000. There is as much more in Chihuahua and other mountainous Mexican states. The Mexican owners of guayule land are seeing that the shrub is gathered in such a way that the supply will not be exhausted. Plants are being left in sufficient quantities to reseed and replace those which are cut down and taken to market. The demand for the shrub is so great that thousands of men are employed in gathering it. The demand for rubber never was so active and the supply is by no means equal to the demand."

LAYING UP THE MOTOR CAR FOR THE WINTER



By Herbert L. Towle

ALTHOUGH the subjects of laying-up and overhauling are frequently treated separately, it is difficult to separate them in practice if any overhauling is required, for the reason that the overhauling is best done when the car is less needed in service. An article in the October 6 issue of Motor Age dealt somewhat fully with the subject of overhauling as the amateur owner can attempt it. The reader therefore is referred to that article for suggestions regarding overhauling. The work of laying-up, strictly speaking, will depend very largely on the extent to which it is complicated by the need of mechanical overhauling.

In theory, the time to overhaul is when the car is first laid up, for the obvious reason that the user is not thereby deprived of the use of the car when spring opens. On the other hand, the natural inclination is to keep the car in service as long as possible when winter sets in. In the early spring, on the other hand, the roads are apt to be soft and in no condition for pleasurable riding, although the air may be agreeably warm. Consequently, by the time the last run of early winter is ended, an unheated garage is likely to be much too cold to permit of working on the car in comfort, and the owner must perforce send the car to a shop or else await the opening of spring to do any prolonged manual work. The practical result of this situation often is that next to nothing is done to prepare the car for hibernation. At most, the car is washed, the axles are propped up, the tires deflated, the cooling system is emptied, and the storage battery and gas generator are provided for according to their needs.

Garage Must Be Warm

Now, it is quite true that a car thus laid up will go comfortably and without material detriment through the winter. On the other hand, it is equally clear that a car so treated is not a business proposition, but purely a pleasure vehicle, which may be kept out of service without serious inconvenience. It is evident that this state of affairs arises purely from the unheated condition of the garage, whence it follows that any car, intended to be used or overhauled in cold weather, simply must be kept in a warm place.

In the paragraphs that follow it will be assumed that the garage is warmed and that whatever work is required can be done comfortably and at the proper time.

Before doing anything to the wheels or tires, set the brakes, put a bar across the front end of the car under the frame, and jack up the frame until the front wheels hang loose, thereby relaxing the spring leaves. Then separate the leaves with a screw driver and force in a paste of graphite grease or graphite mixed with linseed oil to prevent spring squeaks. After lowering the front end of the car, the rear springs may be treated in the same way by blocking the front wheels solidly so the car cannot roll off the jack. Two jacks may be required.

Examine the Tires

After propping up the axles, examine the tires carefully for cuts which reach the fabric, if the tires are fairly new, or if the tires are somewhat old, for sand blisters and signs that the tread has begun to separate. When the tread is half worn through it is not always worth while to repair small cuts which reach the fabric, as there are likely to be so many of them. Any especially bad cuts should of course be attended to. The treads should be inspected for signs of peeling, and the loose portions cut open, cleaned, and vulcanized down with a portable electrical or gasoline vulcanizer. Carefully-kept tires, not too small for their work, are frequently worth retreading if the fabric has not been allowed to get rotten around the cuts from prolonged exposure. After local repairs have been made, either deflate the tires, or, better, remove them from the rims and wrap the shoes and inner tubes separately, storing them in any dry cool place. If the inner tubes have shown signs of leakage in or around the valves, or if the patches on them are temporary, this is a good time to make them air-tight. If the valve itself leaks, a new valve inside, costing 3 cents, will make it tight. If the valve stem is not air-tight where joined to the tube, unscrew the nut and clamp washer at the base of the stem, force in a little rubber cement, and clamp snugly. The writer has found the so-called acid-cure cements satisfactory for repairing inner tube punctures, but a blow-out is best repaired by a vulcanizer. If the rims show rust, scrape and sand-paper them clean and paint them, preferably with some flat color to prevent the tires from sticking, as they might to paint rich in linseed oil or varnish. The best paint is a protective paint such as is used on structural iron. Never leave a car through the winter standing on its own tires, either inflated or deflated, as the bending of the fabric will in time weaken it at that point, and sooner or later it will burst on the road. If demountable rims are used, demount them, clean off any rust which may be present, and grease the binding surfaces to prevent further rusting through the winter.

Flush the radiator by any convenient means. It hardly is possible to do this thoroughly through the small drain cock usually provided. An excellent plan is to disconnect the top of the radiator from the engine and pour water into the radiator while the engine runs, discharging the muddy water from a hose at the top of the engine. Since the rubber hose connections at top and bottom will have to be replaced any way, it is worth while to disconnect them and flush the radiator under pressure from a hose if the plan above suggested is not feasible. At the same time open whatever drain cocks there may be elsewhere in the water system, to prevent water from settling in pockets and freezing. The reason for replacing the rubber hose connections is that they rot in time and the inner layer of rubber is apt to loosen and obstruct the flow of water. If heating of the engine gives reason to suspect the presence of scale, plug the bottom of the radiator and fill it with kerosene, letting it stand thus through the winter. A more effective remedy, but one sometimes dangerous to apply, is a dilute solution of hydrochloric acid, about one of acid to ten of water. The radiator is filled with this and allowed to stand from a quarter to half an hour, depending on the thickness of the scale. After emptying and rinsing, a little ammonia or lime water should be added to neutralize what acid may remain.

Clean the Lamps Carefully

Clean the lamps, clean out the burner holes with a bit of very fine steel wire, and wrap the lamps in tissue paper or muslin to preserve the polish. If a gas tank is used, no particular precautions are required except to make sure that the connections from the gas pipes to the lamp and tank are sound. If a generator is used, empty and clean it, and poke a stiff wire through the gas outlet to make sure that it is not wholly or partly choked. Throw away the old rubber connections to the lamp and generator, unless pump hose is used for that purpose.

Repack the ball or roller bearings in

the front and rear wheels with grease. Clean out the old grease if it is dirty. Do not use graphite grease or animal grease in anti-friction bearings, but pure mineral grease or non-fluid oil. If you suspect that the feeder passages from any of the numerous grease cups on the steering gear, spring shackles, etc., are clogged, unscrew the grease cups and run a wire through, following it with a squirt of kerosene to make sure that the passage is open. Take down the connecting link from the steering column to the right front steering knuckle, clean the ball joints, and repack them in not too stiff grease.

Examine the brake and adjust or renew the linings if needed.

Removing Oil and Dirt

If oil and dirt have accumulated on the engine, clutch, transmission, etc., it is a good idea, though not essential, to wash these parts down with gasoline or kerosene and a paint brush. Points where the dirt may conceal lost motion should be particularly attended to. Scrape the piston heads—this is most easily done by inserting suitably formed soft steel scrapers through the openings over the valves—and see that the spark plugs are clean and in good order. Grind in the exhaust valves, unless trial of the compression shows that they are tight. Adjust the lifters to the minimum clearance—from .005 to .01 inch, according to the accuracy of the cams. Don't attempt to time the valves to certain marks on the fly-wheel. It will make no perceptible difference in the power and a lot of difference in the noise they make.

It is assumed that kerosene has been squirted into the cylinders occasionally on finishing runs, in order to keep the piston rings free of carbon. If this has been neglected squirt a tablespoonful into each cylinder and leave it to soak.

Users are frequently advised to empty all oil from the crankcase and put in fresh oil when laying up. The value of this procedure will depend somewhat on circumstances. If the oil is fed to the crankcase by a mechanical oiler and used up by splashing up to the cylinders, there would seem to be no particular reason for emptying it in the winter more than at any other time, unless examination of a sample drawn from the crankcase shows it to be objectionably dirty. If, however, a circulating system is used, the oil does become dirty in time and it is best to empty it, replenishing with fresh oil. The old oil can be restored to usefulness by filtering through boneblack or fuller's earth, if one chooses to take the trouble; or it may be used up in the gearcase or rear axle by adding a little grease to bring it up to the right consistency. If the engine has been neglected, or if an inferior grade of oil is used, it may be well to flush the entire inside of the engine with kerosene after first draining the crankcase. This is done by pouring a cupful or two into each cylinder and allowing it to work down past the pistons into the crankcase. The engine then is started and run a few minutes with nearly closed throttle, at high speed, to splash the kerosene into all the bearings of the crankcase. The drain plugs are then opened and the dirty kerosene drawn off, after which the crankcase is refilled with clean oil.

As the oil pipes from an oiler on the dashboard are apt to loosen up in time from vibration, it is well to look them over carefully and see whether any joints or unions require to be re-soldered. Unless the pipes are very small and the oil has not been properly strained, there should be no reason to fear stoppage in the pipes; nevertheless, such stoppages occasionally happen, and if there are indications that the oil fails to flow, the suspected pipe should be disconnected and blown out.

Examine the oil or grease in the gearcase. Dissolve a spoonful of it in a glass of gasoline and notice whether there are steel particles in the bottom of the glass. If these are found, they have been worn from the teeth of the gears, and if allowed to accumulate in the gearcase they naturally will not improve the lubrication. In the days when all transmission cases had plain bearings, this steel grit was exceedingly destructive to the bearings, unless wire gauze screens or other filtering means were provided to prevent it from getting into the bearings through the oil pockets above. In case the reader has an old car with plain transmission bearings, and trouble has been experienced owing to the bearings cutting out from grit in the oil, fine wire gauze, about 100 wires to the inch, may be soldered or riveted over the oil pockets with most beneficial results.

Inspect Universal Joints

Examine the universal joints of the propellorshaft. If the grease is dirty or rancid, wash it off with gasoline and repack the joints. It is a common error to use too thick grease in these joints, with the result that it does not work in between the bearing surfaces and the latter presently becomes dry, through surrounded by grease.

Drain out the casing of the rear axle, and if possible flush it somewhat with kerosene before pouring in fresh oil. Oil rather than grease should be used here, but it may be the cheap heavy variety known as gearcase oil. Grease, except the very thinnest mineral grease, is liable not to work itself into the smaller bearings of the differential.

If the car has side-chain drive, the sprocket chain probably will need replacing and quite possibly the sprockets likewise. It usually is a simple matter, by turning the sprockets around or by transposing right to left, to wear the teeth on both faces before discarding the sprockets.

If a storage battery is used, the best way to keep it over winter is to charge it fully, store it in a cool place, and give it a slight freshening charge once a month or 6 weeks. After fully charging, the solution in each cell should be tested and water or acid added to bring its density to approximately 1250 on the specific gravity scale. This applies to the ordinary lead battery. The new Edison battery does not require special lay-up treatment, and it is claimed for one make of lead battery that it is not likely to be injured by being left partly discharged for a considerable time. Dry cells are not worth keeping over the winter, unless one has an Atwater Kent ignition system or something similar.

Go Over the Wiring

Examine every inch of the ignition wiring for bad spots in insulation, breakage of wire inside the insulation, and other defects. If necessary, put in new wiring. A magneto is apt to do better without amateur help than with it. However, the interrupter may be cleaned of oil which may have worked into it, and the distributor may be opened and wiped clean. Do not attempt to adjust the interrupter unless you know exactly what you are about. The reader is advised to consult the maker of his particular type of magneto for instructions in case the interrupter adjustment is changed.

If any attachments, such as horn, fenders, generator, step hangers, etc., have worked loose, now is the time to get after them and make them permanently snug. Nothing betrays the greenhorn sooner than slip-shod fitting of these minor parts, for most of them are very easily made right with a little time and common sense.

If there is any reason to suspect dirt or water in the gasoline, open the drain plug at the bottom of the carbureter and flush the supply pipe thoroughly. Be sure to close the main gasoline valve when you have finished. If the car has a cork float, it may be well to take it out and dry it for several weeks in the possibility that gasoline may have soaked into it. No harm will be done by putting the cork into a warm, not hot, oven for several hours. After drying, the cork should be given a coat or two of shellac and the float adjustment carefully verified.

GALVESTON BEACH TIME

EVANSTON, Ill.,—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly answer the following questions:

1—I want to know the time of the 20-mile 161-230 cubic inches displacement class in the Galveston beach races held this summer; also the 50-mile free-for-all.

2—In laying up a car for the winter is it best to pour cylinder oil in the cylinders or leave them dry?—A Reader.

1—In the 161-230 cubic inches displacement class Henry Petit in a Buick made the 20 miles in 21:42, with George DeWitt in a Buick second in 22:41. In the 231-300 class Plummer in a Marion traveled the 20 miles in 21:52, with Carroll in a Marion second in 23:32. The 50-mile free-for-all was won by Ben Johnson in a Chadwick, the time being 45:26⅘. Full details of these beach races can be found in Motor Age, issue August 11, 1910, pages 4 and 5.

2—It is best to put oil in the cylinders and to use a heavier grade than usual. The heavier the grade the longer it will stick to the walls of the cylinders. It should be put in after the motor has been run for the last time and while still warm. The motor should be turned over a number of times so that the oil may be rubbed into the cylinder walls.

LOW-TENSION FOR LIGHTING

Schenectady, N. Y.—Editor Motor Age—Kindly answer through the Readers' Clearing House the following questions:

1—In using the magneto for electric lighting purposes, is not a low-tension used, and can any low-tension be used without being specially arranged for lighting?

2—Is the A. L. A. M. formula for figuring the horsepower of a four-cycle used the same to figure two-cycle horse power?

3—What is the difference between the Stanley steamer and the White, mechanically speaking?

4—If brakes refuse to work going down hill on an electric, what is the only alternative?—Inquisitive.

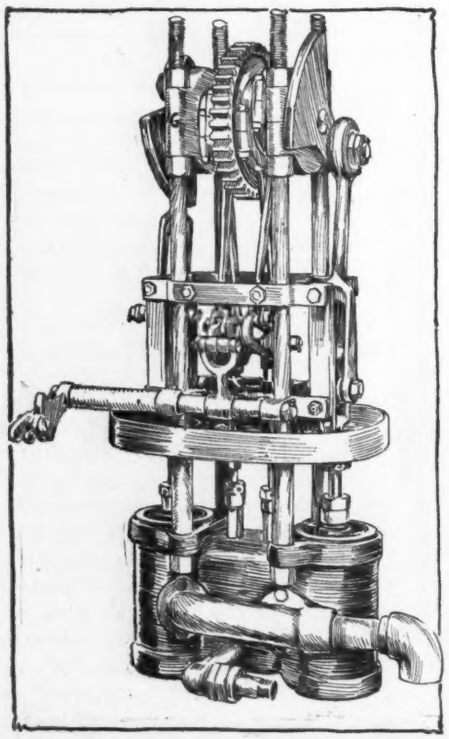


FIG. 1—STANLEY STEAM ENGINE

The Readers'

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

1—The majority of low-tension magnetos now employed for motor car ignition could not be successfully employed for lighting purposes without special arrangements. There are, however, some types on the market which are claimed to give good service for both ignition and lighting. Almost any low-tension magneto if run continuously at a certain speed would have a certain lighting capacity, but whether or not this capacity would be suitable to the requirements of a motor car would depend entirely upon the design and construction of the apparatus. A high-tension magneto, of course, could not be used for lighting under any circumstances.

2—The A. L. A. M. formula for figuring the horsepower of a four-cycle motor could not be used for figuring the power of a two-cycle motor.

3—The only similarity between the Stanley steamer and the White steamer is that steam is used in the engines as a means of power. Mechanically they have practically no resemblance. The Stanley steamer generates its steam in a regular boiler mounted under the hood. This steam is conducted to the engine, which occupies a horizontal position under the body of the car and is rigidly attached to the rear axle. In the White car the steam is made in a generator located under the front seat of the body, and conducted to the engine, which is of the vertical type and supported on two cross members of the frame at the front end under the hood. The power is transmitted to a gearset on the rear axle by means of a long driveshaft with universal joints. The rear axle itself is a conventional bevel-gear type. The Stanley steam car has a double simple engine whose features are shown in Fig. 1, and as the engine is mounted on the rear axle, it requires no driveshaft or universal joint. The Stanley drives with spur gears, one of which is shown at G, Fig. 1. The White generator, Fig. 3, may be described as the fundamental distinguishing feature of the White steam car. There is no point of resemblance between the White generator, Fig. 3, and the Stanley boiler, Fig. 2, except that they both perform the function of converting water into steam. An essential point of difference between the two is that in the White generator the water is at the top and the steam at the bottom, while in the ordinary boiler the water is at the bottom and the steam at the top. The constructional details of these two cars and their relative advantages are thoroughly described and illustrated in the catalogs of their makers, which may be obtained either direct from the manufacturers or their agents.

FIG. 2—BOILER OF STANLEY STEAMER

4—If the brakes should refuse to work while going down hill on an electric, the only alternative is to apply the reverse if the momentum is not too great; run into the bank, if there be a bank; or keep on going until the bottom of the hill is reached.

POPE-TRIBUNE PARTS

Fulton, Ind.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly inform me where I can secure parts and repairs for the Pope-Tribune car?—Charles L. Patterson.

Repair parts can be secured from Joseph B. Diebler, 1328 Michigan avenue, Chicago.

ANTI-FREEZING SOLUTION

Dewey, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age kindly give me the different anti-freezing solutions for gasoline engines, and which does Motor Age recommend as the safest and best and not injurious to the engine in any way? Does the cold weather injure or have a tendency to weaken storage batteries and dry cells?—Thomas Ogden.

An article on the different anti-freezing solutions employed for gasoline engines in the winter time is to be found in the Repair Shop department of this issue. Low temperature will reduce the efficiency of a dry cell temporarily. For this reason one should not test dry cells for amperage while cold. This temporary reduction in amperage does not injure the cell, for moderate

Clearing House

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

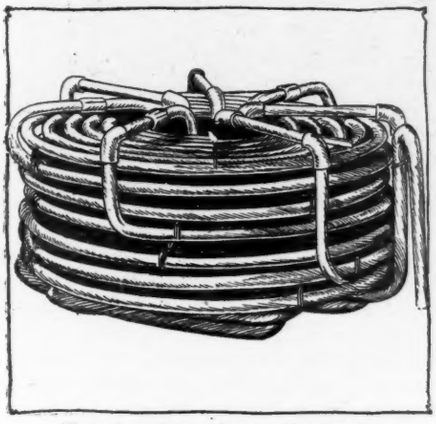


FIG. 3—WHITE STEAM GENERATOR

temperature will restore it. Practically the same is true of the storage battery, though the conditions of charging also affect the efficiency of the storage battery in cold weather. A battery charged in a warm room will give a higher efficiency when subject to low temperature than one charged in a cold room. The efficiency of a storage battery at 20 degrees below zero is reduced 25 per cent, it is claimed.

LONG-STROKE MOTOR

Quincy, Ill.—Editor Motor Age—Will Motor Age, through the Readers' Clearing House, kindly answer the following questions:

1—I have a four-cylinder, 30-horsepower Maxwell. I use a set of dry batteries to start the engine and then switch to the magneto. Unless the spark is advanced about one-half or to its limit, the motor will stop. If the throttle is opened about three or four notches and the spark then retarded, it will run for a while and then die down. If I attempt to speed up the motor with spark retarded a back-firing immediately occurs. The spark plugs are good and the wiring is all right, so I suppose the trouble is in the magneto, as no back-firing occurs when running on the batteries with spark retarded.

2—Why is the Buick, which Chevrolet drives, called the Marquette Buick?

3—Who is considered the world's greatest driver?

4—Is a long-stroke motor any more powerful than a short-stroke one, and why? And what are the advantages of each?

5—What car was called the 999?

6—Has the Maxwell 30 been improved any for 1911? If so, in what way?

7—What should be about the number of pounds per horsepower to make a good, reliable, powerful car?—Motorist.

1—The symptoms of your motor trouble would lead one to diagnose the case as being due to either burnt, pitted, dirty or ill-adjusted platinum points on the circuit-breaker of the magneto, or weak magnets. Remove the circuit-breaker box cover and separate and examine the platinum points; if they are in good shape, then suspect the magnets. It would pay you to refer to page 35 of the August 4 issue of the Motor Age, where a thorough description of the possible troubles likely to occur to a magneto of the same make as yours is given, with means for properly treating and adjusting them.

2—The Marquette-Buick cars are so called because they are made at the Marquette-Buick factory at Saginaw, Mich., the regular Buicks being manufactured at the Buick factory at Flint, Mich.

3—It is a matter of individual opinion, as there are several likely candidates, among whom might be included Nazzaro and Hemery on the road, and Oldfield on the 1-mile circular track.

4—It is well known that the long-stroke motor is very popular in Europe, and a number of American manufacturers have this year brought out motors with an unusually large ratio of stroke to bore, claiming greater economy, flexibility and wearing qualities for the long-stroke motor. As to the advantage of the long-stroke from a standpoint of economy and wearing qualities, there can be no question; its claim to superiority with respect to flexibility is doubtful, while the short-stroke motor is decidedly in the advantage when the question of weight is considered. It follows from this that whether a long-stroke motor or one of a short stroke is preferable depends to a great extent upon the use to which the motor is to be put. In motor car service the long-stroke motor is particularly adapted for commercial cars, on which its increased weight and size is of little consequence, while its greater fuel economy and increased lease of life are valuable features.

It is known that the power developed by a motor, other things being equal, increases slightly faster than the piston head area and slightly less rapidly than the stroke, and that the linear speed of the piston increases a little with the length of the stroke, but much less rapidly than it. This shows that the long-stroke motor is not advantageous from the point of view of specific power. When the length of stroke is increased the crank arms, connecting rods and cylinders must all be lengthened, which results in a material increase in weight, while only a slight increase in power is obtained.

The aeronautic motors which have proven most successful are short-stroke motors. The short-stroke motor for the same power output must run at a higher speed of revolution. The inertia forces in a motor are proportional at equal piston speeds to the number of revolutions. These forces and the strains and vibrations which they entail therefore are greater in the short-stroke motor than in the long-stroke. The compression chamber of a long-stroke motor is more compact than in a short motor, thus assuring a slightly greater thermal efficiency for the former, and, turning at a lower speed of revolution, it is easier to secure a quiet operation in the long-stroke motor, of the various accessories, such as the valves, magneto and pump. It results from the above that, considered by itself, the long-stroke motor is superior to the short motor from every point of view, except that of specific power, which, moreover, is not effected to any serious extent, when considered for use on a motor car. It may, therefore, be concluded that the stroke should be made as long as the general design of the vehicle will permit.

5—The old racing car 999, made famous by Barney Oldfield, was a Ford car.

6—But few changes have been made in the 30-horsepower Maxwell for 1911. There is a slight modification of the oiling system, a new Maxwell carbureter is fitted, a new type of grease cup is to be found on the rear axle, all body designs are of the vestibule or front door type, the standard body color will be dark Brewster green, and green will be the color of the wheels.

7—Good, reliable, powerful cars now in use average about 100 pounds per horsepower.

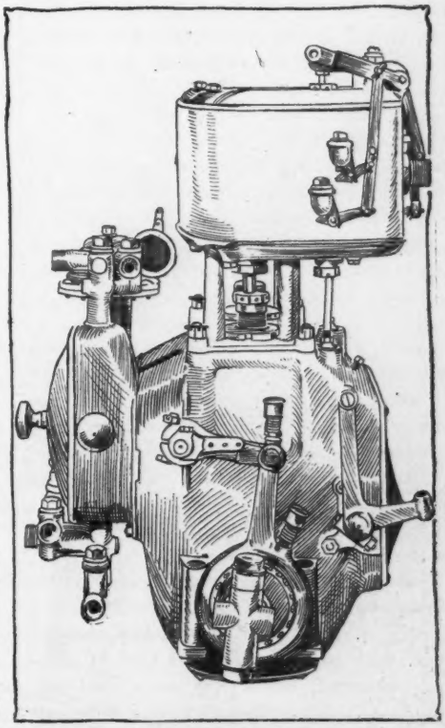


FIG. 4—WHITE STEAM ENGINE

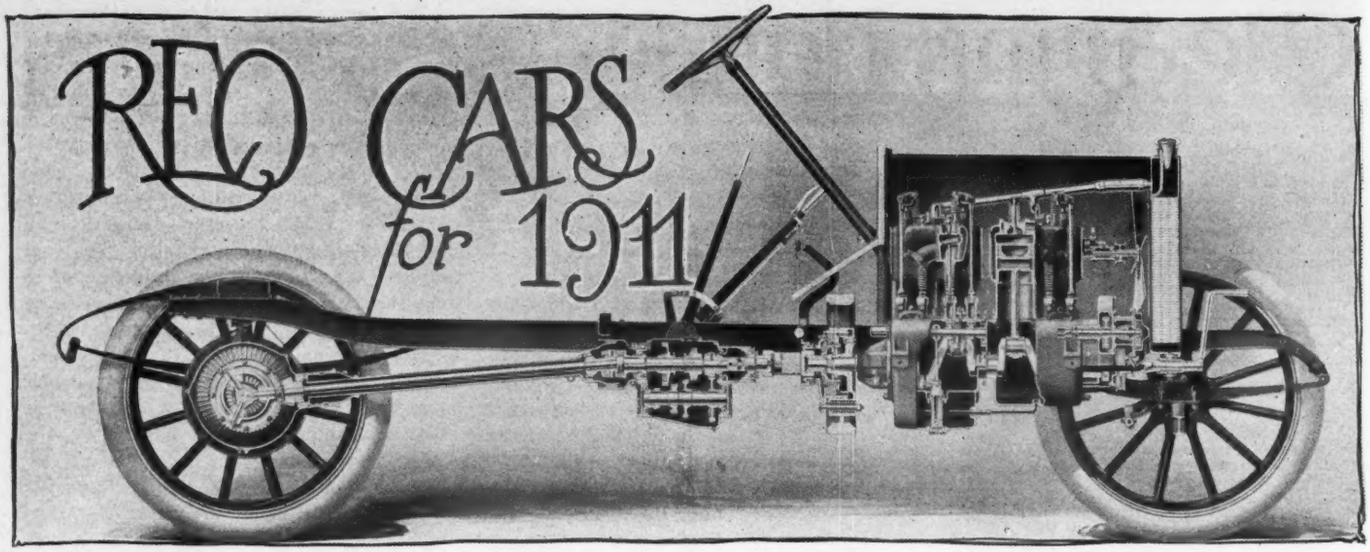


FIG. 1—SHOWING MANY INTERESTING DETAILS OF THE CONSTRUCTION OF THE 30-HORSEPOWER REO FOR 1911

IN the 1911 announcement of the Reo Motor Car Co., Lansing, Mich., it is found that the usual endeavor to meet the popular demand for high-grade, reliable motor cars at a popular price has been made. The Reo pleasure car line for 1911 will consist chiefly of two chassis models, which will be known as the Reo 30 and Reo 23, both of which will be built on substantially similar lines, except that the model 23 has a slightly smaller motor and the gearset is on the rear axle instead of in the middle of the car as it is on the model 30. Four types of bodies are fitted to the Reo 30, including a five-passenger touring car, a four-passenger roadster, limousine, and landaulet; and on the smaller chassis model only a two-passenger runabout body is fitted.

In the model 30, or 30-horsepower chassis, is preserved all the essential features that are characteristic of the 1910 Reo models, only such changes being made as the past year's service among Reo users has demonstrated would add to the efficiency, reliability, and economy of the product. There is a slight change in the oiling system of this model which allows the use of heavier oils; the carburetor is supplied with a hot-air intake, and the air-jacket around the intake pipe is retained. There is refinement of details in the clutch which make for quieter and smoother running, and also admit of the clutch being removed without in any way disturbing the gearset or motor; and there also are an additional number of disks in the clutch which allow the use of more pliable springs. In the gearset the shifting arm is somewhat heavier than that of last year's models; and slight improvements are to be found in the front and rear axles.

The characteristic features of the 30-horsepower chassis are quite clearly shown in Fig. 1. The motor is of the vertical type, with its four cylinders cast in pairs and mounted on a one-piece cast-iron crankcase. The cylinders have a bore and stroke of 4 by 4¼ inches and with the intake valves in the head and the exhaust valves on the sides, as in an L-type motor. The clutch is a multiple-disk type, contained within the flywheel; a selective sliding gearset is used, which is located amidships, and both the motor and gearset are mounted on a subframe of pressed channel steel. Drive from the gearset to the 34-inch wheels is by means of a propellorshaft enclosed in a torsion tube and a rear axle of the semi-floating type. The wheels are equipped with 3½-inch tires; the front axle is of I-beam section; semi-elliptic front and three-quarter scroll elliptic rear springs are used, and the main frame is of pressed steel, channel section. Left-hand control again is a feature.

The detail construction of the motor is

SPECIFICATIONS OF THE REO FOR THE SEASON OF 1911

Specifications of Reo 30		Specifications of Reo 23	
Bore	4 inches	Bore	3¾ inches
Stroke	4½ inches	Stroke	4¼ inches
Ignition	Dual Splitdorf Magneto System	Ignition	Dual Splitdorf Magneto System
Wheelbase	108 inches	Wheelbase	98 inches
Front springs	Semi-elliptic	Front springs	Semi-elliptic
Rear springs	¾ scroll elliptic	Rear springs	¾ scroll elliptic
Front and rear tires	34 by 3½	Front and rear tires	32 by 3½
Clutch	Multiple disk	Clutch	Multiple disk
Gearset	Selective, three forward speeds	Gearset	Selective, two forward speeds
Drive	Shaft, in torsion tube	Drive	Shaft, in torsion tube
Rear axle	Semi-floating bevel gear type	Rear axle	Semi-floating bevel gear type

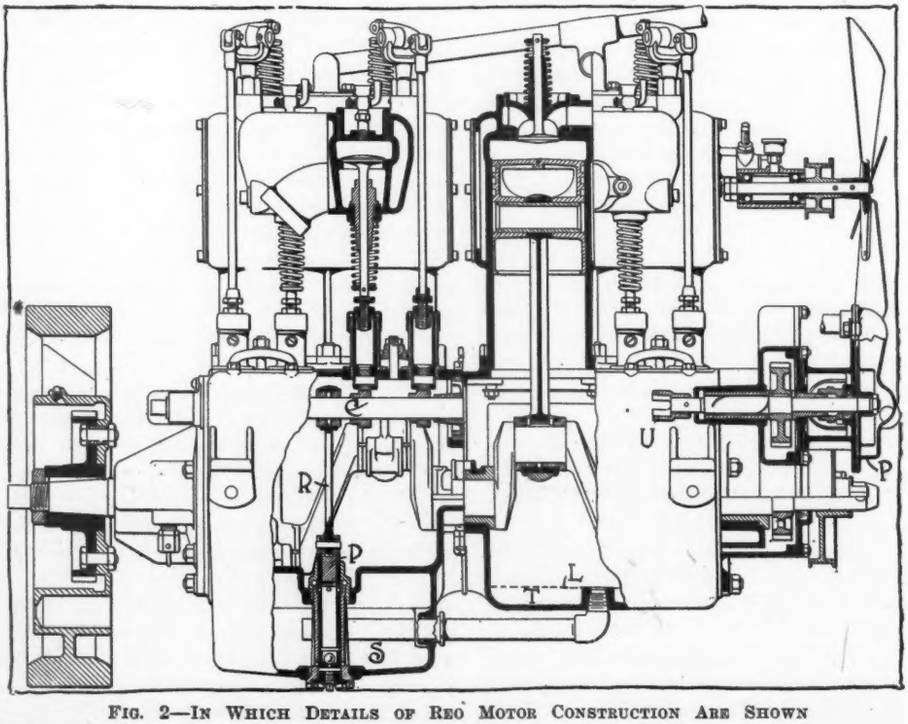


FIG. 2—IN WHICH DETAILS OF REO MOTOR CONSTRUCTION ARE SHOWN

very clearly shown in Fig. 2. The intake valves which are located in the center of the cylinder heads are operated by means of long push-rods and rocker arms, while the exhaust valves, which are located in chambers at the side of the cylinder heads, are operated from the short pushrods. All valves are controlled from a single camshaft located on the right side of the motor. The pushrods and valve tappets are all adjustable, and a single nut and yoke is employed for each pair of pushrod casings. The crankshaft is mounted on three main bearings, as is the camshaft, and both may be removed through the rear end of the crankcase. Two large inspection plates are provided on the left side of the crankcase through which access to the connecting-rod bearings may be readily had. The main bearings of the crankshaft may be adjusted from the outside without dismantling the motor. The engine gears are of the noiseless helical type and enclosed in a separate aluminum housing, which is bolted to the front end of the crankcase.

Lubrication of this motor is by means of a self-contained oiling system inside the crankcase. It is comprised of a plunger pump P operated by means of the rod R and an eccentric on the camshaft C. This pump draws oil from the reservoir S and forces it through internal leads to the three main bearings of the motor and to the face of the spiral engine gears. The oil then gravitates to the partitioned splash compartments T, where a splash level, indicated by the dotted line L, is maintained. Little scoops at the bottom of the connecting rods pick up oil for the connecting-rod bearings and also maintain a fine spray in the entire crank chamber of the motor, which lubricates the working surfaces of the cylinders and pistons, camshaft and cams, and, in fact, all of the internal mechanisms. A ball-bearing, belt-driven fan, a centrifugal water pump, and a tubular radiator of the honeycomb type are features of the cooling system. The water pump P, Fig. 2, is located on the forward end of the shaft from which the magneto is driven. This pump draws the water from the lower portion of the radiator and forces it through a very simple connection directly to the waterjackets surrounding the exhaust valves. The water, after circulating through the valve and cylinder jackets, makes its exit at the top and returns through another simple manifold to the top of the radiator. Large plates are provided at either end of the cylinder jackets to facilitate cleaning, should such an operation become necessary; and to the front plate on the forward pair of cylinders the ball-bearing fan support is adjustably attached.

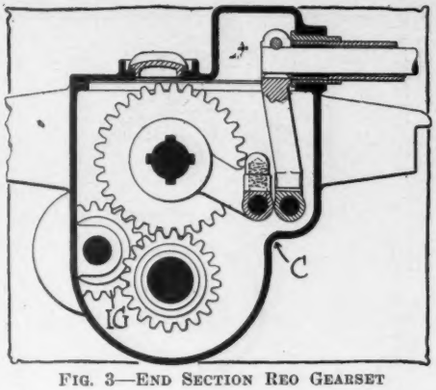


FIG. 3—END SECTION REO GEARSET

A Splitdorf magneto, which is a feature of the dual jump-spark ignition system employed, is mounted on the subframe to the right of the motor and may be readily attached or detached. Its driving shaft is connected to the universal coupling U, Fig. 2. The coil used in connection with this system to transform the low-tension current from either the magneto or dry cells, is located on the dash; and the high-tension cables, which conduct the currents from the distributer of the magneto to the single set of spark plugs conveniently located in the cylinder heads on the left side of the motor, are confined and protected in an insulating tube. The multiple-disk clutch is confined in an oil-tight case cast integral with the flywheel, as illustrated in Fig. 1. A plate forms the flexible and detachable connection between the clutch and gearset.

Features of the gearset construction and design are shown in the plan and side sectional drawings, Figs. 4 and 5. The main and countershafts are in the same vertical plane with the countershaft located directly below the main shaft. Both shafts are mounted on adjustable ball bearings, as may be seen from the side sectional view, Fig. 5. In these drawings the operation of the gearset may be learned quite readily. At A, Fig. 4, which is a view looking down into the top of the gear-box, the sliding gears G and G1 on the mainshaft S are shown with the levers or shifting arms A and A1 attached; also the clutch on the side of the gear G, which meshes with a similar clutch, on the side of the gear G3 for direct drive. Now turning attention to the side sectional view B of the gearset, the gears G, G1 and G2 are again shown. According to the arrangement of the gears in this drawing, the gearset is in a neutral position, and there is no connection between the driving shaft D, in the end of which the end E of shaft S is free to revolve, and the shaft S proper. As the gearset now stands, if the motor were in operation and the clutch in, the gear G2 and all of the gears on the countershaft CS would be revolving, the gear G3 being always in mesh with the gear G2, but the shaft S and its gears G and G1 would be motionless. For first speed, the gear G1 would be slid into mesh with the gear G4 on the countershaft; for second speed the gear G would be brought into mesh with the gear G5, while for high speed or direct drive the clutches T should be brought into mesh. For the reverse speed the gear G1 must be shifted into a position directly over the rear gear RG and into mesh with an idler gear which is always in mesh with the gear RG. This idler gear is shown at IG in the drawing C, Fig. 3, which is an end section through the center of the gearset.

The universal joint of the propellorshaft is connected to the mainshaft S of the gearset and enclosed in a housing H, Fig. 5, which is packed with grease; a plug P being provided in this case for replenishment of lubricant when necessary. Features of the propellorshaft, torsion tube, and rear axle construction are shown in Fig. 7. The cross pieces R fit into slots in a cup-shaped member M of drawing B, Fig. 5; the end of the propellorshaft F is mounted in a Timken roller

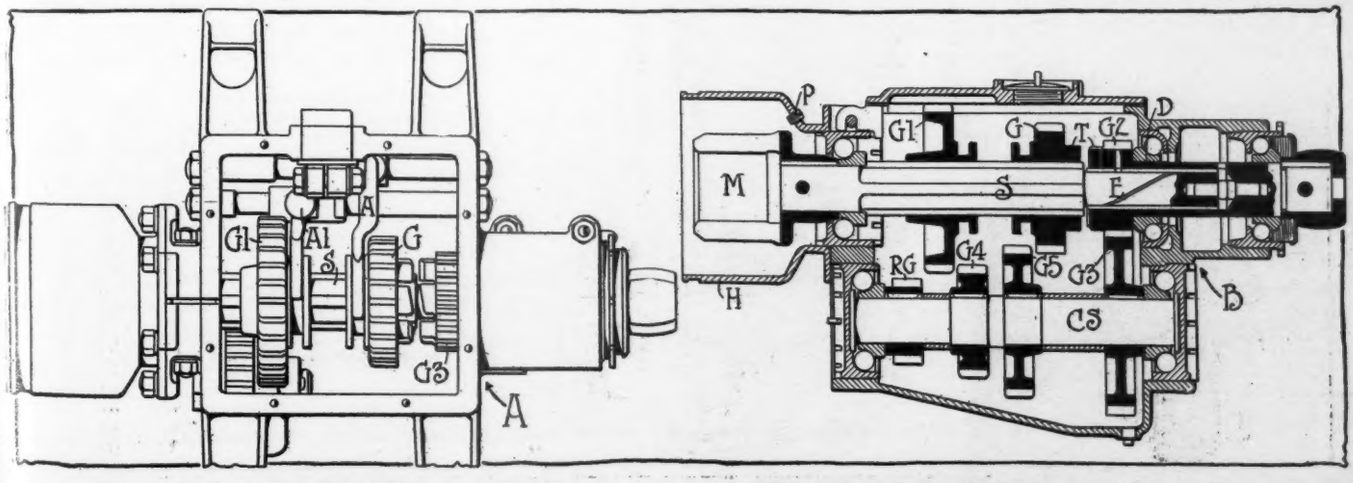


FIG. 4—LOOKING DOWN INTO GEARSET OF REO 30

FIG. 5—SIDE SECTIONAL VIEW OF GEARSET ON REO 30 CARS

bearing B at the forward end as well as at the axle end; and a conventional type of bevel gear drive and differential mechanism is employed as may be readily seen from this drawing. The rear axle is equipped throughout with Timken roller bearings with the exception of the outer ends of the transverse shafts, where plain roller bearings are employed running on hardened steel sleeves and in hardened steel cages. The torsion tube in the 1911 rear axle has been re-enforced at the lower end, as also has the bevel gear housing. An oil-tight device containing a series of felt washers D is provided to prevent the leakage of any oil at both ends of the rear axle, thus making it possible to run the gearcase full of light oil without leakage at the end bearings.

In Fig. 6 features of the Reo brake design are shown, the external contracting band being pedal-operated and the internal expanding shoes being controlled by the hand lever. In the front axle the spindles which are equipped with Timken roller-bearings are to be slightly larger in the 1911 models, and a locking device is provided to prevent the accidental loosening of these bearings. The steering gear is a pinion-and-sector type and differs from other types in that it is of generously large dimensions and not enclosed. A permanent mud pan is fitted between the main and subframe members, and the under hood is held in place with six spring locks, which can be removed in 2 minutes without getting under the car. The control is by spark and throttle levers on the steering posts under the wheel, a foot accelerator, and the regular gear-shifting and emergency-brake levers at the left of the driver's seat.

OPPOSES WOODEN GARAGE

City Councilman T. O. Heatwole, of Baltimore, Md., has introduced an ordinance for the abolition of wooden garages in what is known as the annex of Baltimore. The provision in the ordinance says no frame buildings to be used as garages shall be allowed to be constructed in that part of the annex contained in the Twelfth ward. At present the building code of the city does not permit such structures to be built south of Twenty-sixth street, which is fixed as the northern limit of the so-called fire district.

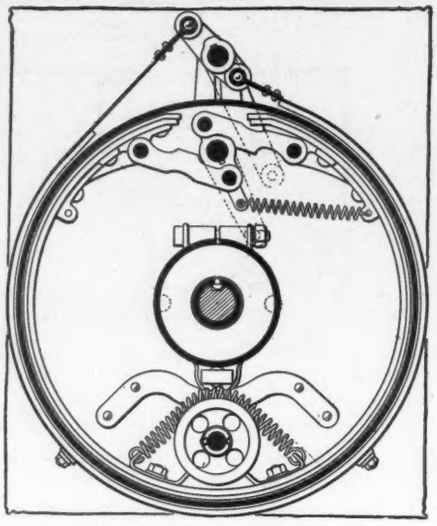


FIG. 6—REO BRAKE DESIGN

Motor Car Literature

The Electric Storage Battery Co., Philadelphia, has issued a new catalog entitled "Electric Lighting for Motor Cars and Marine Service," detailing its electric head, tail, and side lights.

The 1911 Case car, formerly known as the Pierce-Racine, is described and illustrated in a conventional manner in an announcement catalog issued by the J. I. Case Threshing Machine Co., Racine Wis.

A neat little catalog describes a new heater just put on the market by the Al-Ton Motor Accessory Co., Akron, Ohio. This new accessory has been designated the Al-Ton motor car heater and is heated by means of the exhaust gas.

The E. R. Thomas Motor Co., Buffalo, N. Y., is mailing several booklets to the trade calling attention to its cars. "Little Things Done Right on the Thomas Flyer," is a 6 by 9 size booklet issued by the engineering department of this company calling attention to the many interesting mechanical details of the Thomas cars for 1911. "Owners Will Tell You" is a dainty booklet containing extracts from communications received by the company from various Thomas owners.

"The Story of Selden and the Selden Car" is a booklet relating the life story of the famous inventor of the gasoline motor car which the Selden Motor Vehicle Co. is mailing to the trade. Specifications and illustrations of the Selden cars for 1911 are incorporated in the booklet.

The Firestone Tire and Rubber Co., Akron, O., has issued an attractive poster, 26 by 40 inches drawing attention to its non-skid tires. The feature of the illustration is a trail through a non-skid tire, featuring the non-skidding action of the tire when the car rounds a turn in the road.

A 1911 advance catalog of motor car accessories has been issued by J. Stewart Smith, New York, covering such specialties as the Twingrip and Ten-in-One wrenches, license pad holders, the Century automirror, etc.

A particularly attracting catalog is the 1911 issued by the Waverley Co. There are thirteen full-page half-tone illustrations detailing the Waverley models for the 1911 season. It is 9 by 14 inches, printed on heavy enamel paper. The cover is a rich mottled brown and on the front inside cover page is mounted a photogravure representing a Waverley electric in one of the beautiful parks of Los Angeles, the brown tones of the photogravure on Japanese vellums harmonizing with the cover stock. The catalog is rich and beautiful in its entirety.

The Hagstrom Brothers Mfg. Co., Lindsborg, Kan., is sending out to the trade glass paper weights, featuring the Hagstrom spark plugs.

A de luxe catalog has been received from the Peerless Motor Car Co., Cleveland, O., featuring its models, three in all, for the 1911 season. It is handsomely printed and from cover page to cover page is rich and beautiful.

An interesting booklet has been received from the Fisk Rubber Co., Chicopee Falls, Mass., which was issued in connection with the fire chiefs' convention at Syracuse last August, and which describes the new Fisk dual removable rim equipment for

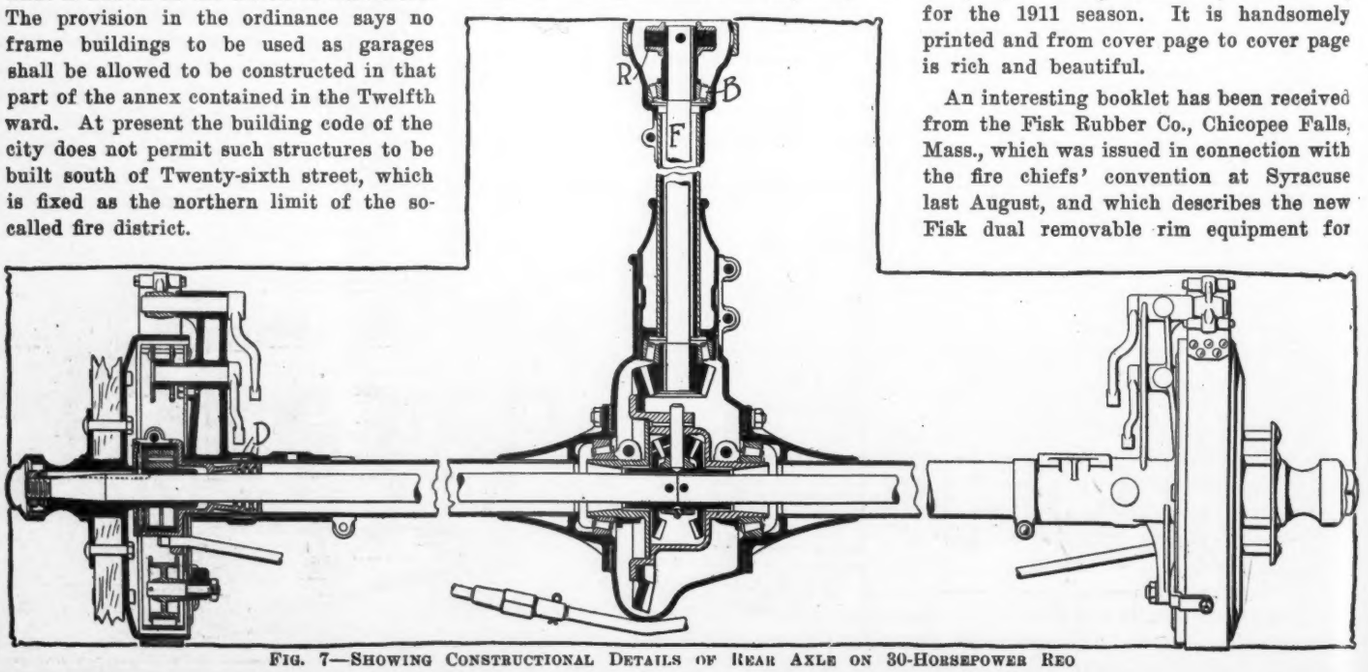


FIG. 7—SHOWING CONSTRUCTIONAL DETAILS OF REAR AXLE ON 30-HORSEPOWER REO

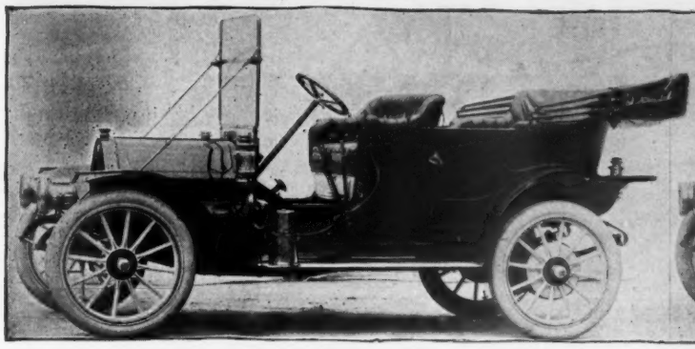


FIG. 8—TOURING CAR BODY OF 1911 REO MODEL R

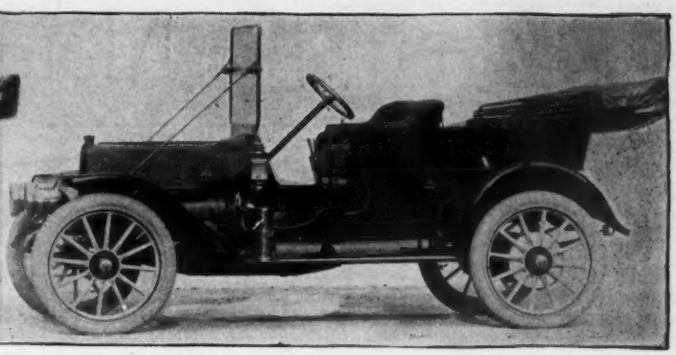


FIG. 9—THE BODY DESIGN OF 1911 REO MODEL S

use on fire apparatus and which can be used as well on motor trucks.

L. L. Whitman is out with a brand new story entitled "Coast to Coast in a Reo." It is a handsome 5 by 10½-inch brochure of twenty-four pages, well illustrated from cover to cover, and treats of his last strenuous and sensational transcontinental record run in his own vigorous and humorous way. It will be remembered that Whitman lowered the Coast to Coast record on August 18 in a 1911 Reo 4-30 nearly 5 days, his time being 10 days, 15 hours, 13 minutes.

"What Sears Owners Say," is the title of a fifty-two-paged booklet of letters, compiled by Sears, Roebuck & Co., Chicago, from owners of Sears cars.

The 1910 catalog of the Reliance Motor Truck Co., describes and pictures in detail its line of commercial cars.

A commercial catalog recently received is from the Oliver Motor Car Co., Detroit, Mich., in which is listed, and described and illustrated the various types of Oliver commercial vehicles.

The Mechanigraph is a booklet from Topping Bros., New York, calling attention to the mechanigraph, an instrument which makes transparent and printable almost instantly an opaque pencil or pen drawing.

"The White Steamer" is the subject of an interesting treatise by A. T. Edmondson, dealing in condensed form with steam mechanics as applied to the White Steamer, under such subjects as hints on economy, lubrication and instructions for adjusting temperature on old and new regulation. Five charts with detailed explanations complete the book.

Manufacturers' Communications

MAKES OWN METAL PARTS

Indianapolis, Ind.—Editor Motor Age—We noted in a recent issue of Motor Age an item concerning a new building which we contemplate putting up. The statement is made in this article that we plan to manufacture some of the sheet metal parts which we have bought heretofore. This is an error, since we have always manufactured, ourselves, all of the sheet metal work which enters into the construction of our car. In fact, there is very little of our car which we do not manufacture ourselves.—Nordyke & Marmon Co.

LUBRICATION METHODS

Rochester, N. Y.—Editor Motor Age—It is commonly supposed that automatic constant flow lubrication, when properly regulated, is calculated to overcome any tendency to smoking at the exhaust which, in the older splash system, results from irregular and frequently over-abundant supply. In the system in which the oil is forced through ducts in the crankshaft in particular it is supposed that except where the regulation device is out of order there should be no tendency to overfeeding. That such is not necessarily the case has been proven in many instances to the mystification of the driver. In one instance the difficulty was located in an unexpected point when the big end bearings of the connecting rods were taken up after having developed an inordinate amount of play. A result of the undue lost motion, the effective area of the delivery openings at the connecting rod bearings was increased, and although the pressure in the system was in no way affected, large quantities of oil were delivered, with the result that the engine began to give unmistakable signs of overlubrication.—Vacuum Oil Co., Frank B. Killian.

FINISH OF LAMPS

Buffalo, N. Y.—Editor Motor Age—Each manufacturing season in the motor car world brings out some new trend on the part of the user and usually this is strong enough to guide the maker who takes pains to keep in close touch with the army of users and prepare for its wants. One of the strongest developments of the present season has been in the demand for bright and black nickel finish for the exposed metal parts of the car that, in former years, have either been given a brass finish or painted. This demand has been felt particularly by the Pierce-Arrow Motor Car Co., and a goodly percentage of its orders for new models either have the bright or black nickel, known as gunmetal, specified for the radiator front, lamps, door handles, hub caps, etc. It is not thought that this is in any sense a fad of the moment, since the demand has been increasing steadily for several years past. Many chauffeurs request the nickel when their employers are ordering new cars, as they hold that this finish is much easier to keep clean and bright than brass, which has a tendency to become tarnished when exposed to the elements. The demand for this departure from the customary is not confined to any one class of cars, but is about equally divided between the open and enclosed vehicles.—Pierce-Arrow Motor Car Co.

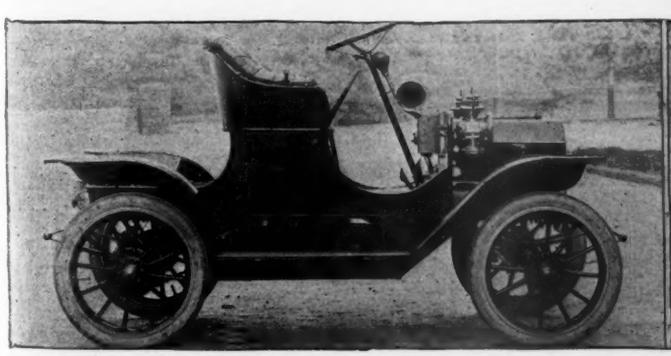


FIG. 10—THE ONE-CYLINDER REO STILL ON THE MARKET

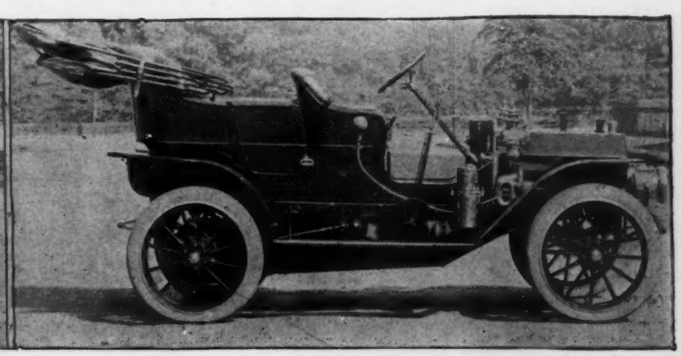


FIG. 11—THE TWO-CYLINDER REO TOURING CAR

The Motor Car Repair Shop

Anti-Freezing Solutions

JACK FROST is now on the rampage and if the motorist would prevent the bursting of the water manifolds, radiator and cylinder jackets of his motor, he will put the anti-freezing solution in his cooling system now. There are several solutions which have been in common use in the cooling systems of motor cars for several years, and a resume of these anti-freezing mixtures and a way of obtaining and preparing them should be appreciated at this time. The most widely used and easily obtained preparations are wood alcohol, calcium chloride, glycerine and common salt in water. Most popular among these is the wood alcohol solution, then comes the glycerine or alcohol and glycerine preparations. The calcium chloride preparation though not so popular has a large following, while the saline or salt solution is the least popular.

Wood Alcohol Solution

The wood alcohol solution is usually preferred because it is clean, does not damage the metal of the waterjackets or radiator, and has no deleterious effect upon the rubber hose connections, its only fault being that it evaporates very readily if a motor is inclined to run warm. It can be used in either large or small quantities according to the occurrent drops in temperature of the latitude in which it is employed, and the following table will give a fair idea of what may be expected of the various proportions of the mixture:

Percentage in water	Freezing point
10	18
20	5
25	—2
30	—9
35	—15
40	—24

To make clear the meaning of these figures, taking for example the first figures, 10 under the heading of percentage in water would mean that ten parts of alcohol should be mixed with ninety parts of water. This would prevent freezing at temperatures as low as 18 degrees above zero. The last figures would mean that forty parts of alcohol with sixty parts of water would insure the solution against freezing at 24 degrees below zero. In general the 25 per cent solution will be sufficient for all ordinary occasions. In many cases one filling of the radiator with an alcohol solution will last throughout the entire winter; but should any loss of radiator supply occur it should be replaced with equal parts of alcohol and water.

Calcium Chloride and Water

Calcium chloride $Cacl_2$ is a very effective cooling agent, but unless the chemically pure article is used there is danger of corrosion of the metal with which it comes in contact. Crude calcium chloride retails at about 8 cents or 10 cents per pound, and is to be avoided, but the chemically pure article required costs about 25 cents a pound when bought in small quantities. A solution of 5 pounds of calcium chloride to each gallon of water will not freeze at any temperature above 39 degrees below zero. The following table will show the proper proportions of a calcium chloride solution for the different temperatures:

For each gallon of water	Freezing point
1 pound	27
2 pounds	18
3 pounds	—1.5
3½ pounds	—8
4 pounds	—17
5 pounds	—39

The best way to make this solution is to make what is called a saturated solution then add water to it until the required mixture is obtained. To make a saturated solution mix with a quantity of water warmed to 60 degrees Fahrenheit all the calcium chloride the water will dissolve. If chemically pure calcium chloride is used no trouble will result, but chloride of lime, $CaOCL_2$, often sold as pure calcium chloride, should not be used. It has been advised that a handful of lime be added to this solution to render it alkaline. This is done to prevent an acidic action of the solution on the metals and its consequent setting up of electrolytic action.

Glycerine and Water

Glycerine is an effective cooling agent and as it will not crystalize in the waterjackets it is preferable in this respect to calcium chloride, and it has the further merit of not requiring any renewal during the season as it does not evaporate. It therefore is necessary only to add pure water to replace that which has evaporated. As with the other solutions, there are several solutions of glycerine and water for different temperatures, which are as follows:

Percentage in water	Freezing point
10	28
30	15
40	5
50	—2
55	—10

These solutions have been known to work very well indeed, although it is true that glycerine does affect the rubber hose connections but not so rapidly as to become over-troublesome. In using the glycerine solution care should be taken to thoroughly cleanse the jackets of any residue of crystals from calcium solutions previously used, as this residue will thicken and clog the glycerine solution and render it partially ineffective. Solutions of glycerine will thicken up when subject to low temperature but will not solidify, and where there is no solidification there is no disruption of the piping of the radiator or of the jackets of the cylinders. The slush formation of a glycerine solution passes through a water pump with apparent ease, and as this is probably the most constricted point in the system the circulation is not noticeably impaired. If a system gets hot with a solution of this kind it is the water that boils off and to replace it is all that has to be done, for about three months at a time. Should the solution, after a time, lose all semblance of its original balance, to start over again with a new solution is the wisest course to follow if one would be on the safe side.

Alcohol, Glycerine and Water

Since either alcohol or glycerine added to water will lower the freezing point, it has been found that combined they would do the same thing, each in its proportion to the water present. They form no chemical combinations but are merely mechanical mixtures. Assuming that the wood alcohol is to be preferred because it is less liable to choke up the constricted passageway or attack the hose connections, and outside these evils, which are characteristic of a glycerine and water solution, it is a most desirable and substantial mixture; then it is well to consider the advisability of reducing the quantity of glycerine and substituting alcohol instead. By the use of both alcohol and glycerine the total proportion of water can be increased and this is a step in the right direction as the cost is decreased and the stability of the mixture increased. Combinations of alcohol, glycerine and water have given very satisfactory service. The following combinations of half alcohol, half glycerine and water are most popular:

Percentage in water	Freezing point
10	25
20	15
25	8
30	—5
35	—15

Common Salt Solution

As for a saturated solution of common salt, sodium chloride, it remains fluid down to zero degrees Fahrenheit. An objectionable feature of its use, however, is that an incrustation forms as the water evaporates, and it is claimed electrolytic action will follow its use. Common salt is cheap, that is the one thing in its favor, but radiators are costly, delicate and composite in construction, that is to say there are a number of metals in the makeup of radiators; electrolytic action, therefore, would follow due to the difference of potential natural to different metals immersed in a saline bath. The saline solution is claimed to have given satisfaction by a number of its users, but it is still a question as to the extent to which saline solution can be used with safety. It is claimed that cast iron seems to rot in salt water.

Legal Lights and Side Lights

IT IS AND IT ISN'T

UNDER the Texas statute "one carriage or buggy" is included in the list of property reserved to every family as "exempt from attachment or execution and every other species of forced sale," etc. The question recently raised was whether a motor car was a carriage within the meaning of the statute. The court held it was, and said in part in the case of Parker vs. Sweet, 127 S. W., Tex., 881:

"A motor car is essentially a carriage, used for identically the same purposes as the horse-drawn carriages of our fathers' days, the principal difference between the two being the motor power employed. From the standpoint of utility no distinction can be made between the two. * * * The supreme court held that a mule was a horse within the meaning of our exemption statutes. If a mule is a horse, undoubtedly a motor car is a carriage."

In Massachusetts there is a statute which provides in substance that whoever with intent to cheat the owner thereof, refuses to pay for the use of a horse or carriage the lawful fare should be punished by a fine of not more than $20 or by imprisonment for not more than 2 months, or by both. Under this statute, the state attempted to convict the defendant who cheated a motor car owner out of his fare. The state claimed that the word carriage included the motor car as well as the horse-drawn vehicle. The court says in part, in Commonwealth vs. Goldman, 91 Northeastern, Massachusetts, 392:

"It is certain that when this statute was originally enacted, the legislature, in using the word carriage, had no thought of a vehicle made up in a large part of complicated machinery, and propelled by a powerful engine whose operation is similar to that of locomotive engines on railroads. While such a vehicle may be called a carriage in the broad sense that it is used to carry persons and property, it is not commonly referred to as a carriage, but is distinguished from carriages by another name to designate a vehicle of an entirely different character. We are of opinion that motor cars are not included in this statute."

CALLS IT FELONY

"Where employes of a garage, after a motor car had been taken therefrom without payment of claims against the owner, took the car from a public street, with intent to force payment of the bill and deprive the owner of its use until he paid, and the proprietor with knowledge of the facts, ratified and adopted the act, and refused to give up the car, so that a felony was committed, and a police officer had reason to believe that the proprietor had directed that the car be so stolen, he could arrest the proprietor without a warrant," says the court in Greene vs. Fankhauser, 121 N. Y. Sup. 1004. The court continues:

"The plaintiff—the proprietor of the garage—brought the arrest upon himself. By holding the motor car and with knowledge of all the facts refusing to deliver it to the owner he adopted the acts of Murphy and Daly—employes of the garage—as if he had personally seized the car in the public street. It is possible, but not probable, that a man holding the position of general manager of a motor car company thought he had a right to thus seize the car, but it is highly probable that he has heard of the remedy afforded by an action in replevin to obtain possession of personal property, and, instead of resorting to it, he took the law into his own hands, and thus brought it to bear upon himself, and has no just ground of complaint according to this record."

RECOVERING FROM CITIES

A recent Massachusetts case settles the law on two points that quite probably have been in the minds of owners from time to time. It was in Felly vs. the City of Melrose, 91 Northwestern, Mass., 307. The first question was whether passengers or guests in a motor car could recover from a municipal corporation for injuries resulting from defects in the highway when the driver of the car was in part responsible, because of his negligence, for the injury. On this point the court says:

"If the injury to the female plaintiffs was due in part to the negligence of Brooks in driving the motor car, then it could not be said that the defect in the highway was the sole cause of their injury within the meaning of our decisions. It is not because the negligence of Brooks is to be imputed to these plaintiffs that they fail of recovery, but because by reason of that negligence, although they are not responsible for it, it could not be found that the defect in the way was the sole cause of the injury."

The second point involved was whether passengers in a motor car, not registered according to law, could recover against a municipal corporation for injuries caused by a defect in a highway, even if the passengers did not know that the car was not registered. The court says:

"If the motor car in which the female plaintiffs were riding was not registered according to the requirements of the law, it was unlawfully upon the way; those who were using it were not travelers, but trespassers; and it would follow that they could not maintain this action. Each one of the plaintiffs must fail of recovery in that event. It would not help the female plaintiffs that they may not have known that the motor car was not duly registered; they did not know that it was, and it was at their own peril, that they undertook to use a vehicle, the use of which was prohibited by law."

LIABLE FOR DAMAGES

"It is the duty of the operator of a motor car upon highways to employ a degree of care commensurate with the risk of danger to others, engendered by the use of such a machine on a public street and he must use every reasonable precaution to avoid causing injury, which requires him to take into consideration the character of his machine and its tendency to frighten horses," says the court in Tudor vs. Bowen, 67 S. E., N. C., 1015.

"A motorist must do whatever is reasonably required to relieve persons of peril when he sees a horse is becoming frightened by his machine, and where defendant cranked up his car in close proximity to a team of horses manifesting fright at the noise, which defendant must have seen if observant, and he continued cranking until his machine started up with such a noise that the horses ran away, he was liable for the damage they caused, especially where his machine to his knowledge was one making an unusual amount of noise when cranked."

HORSE THE ISSUE

In an action against a car owner for injuries resulting from frightening a horse in a city street, evidence that the horse was unsafe, and would become unmanageable at the sight of a motor car, was admissible on the issue of contributory negligence, and to aid the jury in determining whether the horse was the sole cause of plaintiff's injuries. This was settled in Bliss vs. Wolcott, 107 Pas. Mont., 423.

CIRCUMSTANTIAL EVIDENCE

Where, in an action for injury to plaintiff in a collision between her buggy and defendant's motor car, defendant denied any collision, and showed that an examination of the motor car on the morning after the accident showed no marks thereon, and that the lamps on the front of the machine were not broken or injured, evidence that defendant while driving the machine earlier on the same day had collided with another vehicle was admissible to show that it was possible for a motor car to collide with another vehicle without leaving visible evidence of the fact on the machine itself. This was settled in Klein vs. Burleson, 122 N. Y. Sup., 753.

From the

MARYLANDERS Signboarding — The Automobile Club of Maryland is rushing the work of posting road signs throughout the state. Just now, under the supervision of Secretary Luzius, signs are being posted on the way to Halethorpe.

Old Officers Re-elected—The annual meeting and election of officers of the Massachusetts State A. A. held here last Friday night the following officers were re-elected unanimously: A. D. Converse, Winchendon, president; J. P. Coghlin, Worcester, vice-president; James Fortesque, Boston, secretary and treasurer. Vice-President Coghlin was made chairman of the legislation committee, W. H. Chase chairman of the good roads committee, and A. E. Lerche chairman of the signs committee. The association now has a membership of 4,300.

St. Louis Seeks Show Dates—The St. Louis show committee is to meet next week to select not only the date, which already has been virtually fixed as immediately following the Chicago show, but also to choose the place in which the show will be held. Talk among the dealers reveals considerable opposition to the militia armory, where the show was held last year, a number favoring the Coliseum. The latter place is able to provide less space than the former, but it is thought that this difficulty can be overcome by the erection of platforms in the balcony.

Catch Car Thieves—A number of additional arrests have been made by the Indianapolis police in their investigation of the motor car thefts that have taken place during the last 6 months. So far the police have made thirteen arrests and they believe all of the thieves have been captured. Most of the boys arrested have been bound over to the grand jury, under heavy bond, on charges of grand larceny. Many of the boys have confessed. They took cars, drove them for several hours, and finally abandoned them in out of the way places, badly damaged.

Wisconsin Starts Right—The Wisconsin State Automobile Association and the Citizens' Business League of Milwaukee, Wis., officially started two comprehensive good roads projects last week. One is a lake-to-river road from Milwaukee, on Lake Michigan, to LaCrosse, Wis., on the Mississippi river. The other is a boundary-to-peninsula or lake shore drive from the Illinois boundary along the west shore of Lake Michigan to Marinette, Wis., at the upper Michigan boundary. M. C. Moore, president of the Wisconsin State A. A.; P. C. Avery, Wisconsin representative to the National Good Roads Congress; Francis A. Cannon, secretary of the Business League, and Emil Schandein, of the Milwaukee Automobile Club, did the first actual work on the projects. The worst piece of roadway in Milwaukee was dragged and scraped one entire afternoon and the results will be used as an example. Before and after pictures were taken for use in the campaign. It is the plan to interest commercial and civic organizations, motor clubs, farmers and other individuals in the projects and compel practical effort immediately.

Caring for Tourists—One of the innovations planned for the new quarters in the Onondaga of the Automobile Club of Syracuse is a desk at which women tourists stopping over in the Salt town for a breathing space may write letters. The most ample arrangements have been made, too, for the keeping on file of all routing information for the convenience of motorists.

Turnpike In Bad Shape—The state work on the Jericho turnpike east of the Nassau-Suffolk line in New York state has left that road in such poor condition that for 2 miles it is practically impassable. Motorists wishing to reach Commack, Smithtown, St. James, Port Jefferson and other towns on the north side are advised to leave the Jericho turnpike at Woodbury and go through Huntington and Centerport to Northport, thence south to the turnpike again.

Interested in Electric Test—Although the North American's roadability run for electric pleasure vehicles is nearly a month off, four entries have so far been received, two Buicks and two Babcocks. The run is in no essential a speed contest, which fact is expected to make it particularly attractive to women. Checkers are to be placed at various points along the route and a limit placed on the time at which cars may reach these stations. The run will start and finish in front of the North American building, and silver trophies will be awarded to the cars in the several classes that come nearest to the secret time, which will not be known till the end of the run.

Motoring in Ontario—The eleventh edition of the list of permits to operate vehicles in the province of Ontario has been issued by the provincial secretary's department. Some interesting figures relative to motoring in that province may be obtained from it. According to it, 9,999 permits have been issued in Ontario. Placing the average value of each car at $1,500 and numbering the machines actually owned in Ontario at 9,000, it appears that Ontario's investment in motor cars amounts to $13,500,000. The number of licensed chauffeurs in Ontario is over 1,800. These men receive from $12 to $20 weekly. Taking the average wage at $15, Ontario's weekly tribute to more or less skilled operators amounts to $27,000. It is almost impossible to estimate the average gasoline consumption, but on a weekly basis of 20 gallons per car at 20 cents per gallon, Ontario pays every week for its motor fuel $36,000. To this must be added the cost of lubricating oil, tires and repairs. There are fifty-two dealers in the Province of Ontario who are licensed to sell and demonstrate motor cars.

After Careless Drivers—War is being made by Service Director J. R. Cowell, of Toledo, on the drivers of loaded wagons who carelessly allow coal, sand, stone, glass and other debris to drop from their vehicles on the streets. Tires have suffered greatly as the result of this carelessness and criminal prosecution is threatened by the director unless the practice is stopped.

Must Not Tamper—The executive committee of the Louisville Automobile Club has offered a reward of $10 in cases where persons are found tampering with a motor car in which they have no interest, and a reward of $25 for the arrest and conviction following the theft of a machine, where it is left in front of a club, store or restaurant by the owner. Officers of the club say that this sort of practice has become too frequent in Louisville.

Philadelphia Aroused—The motor car is to supersede the fire-horse in Philadelphia. Director of Public Safety Clay has completed plans to supply eleven district fire engineers with motor cars, bids for which will be asked in a few days. The gradual elimination of the horse throughout the whole city will then take place. Motor chemical wagons will replace horse-drawn equipment and eventually fire engines operated by their own power will be installed.

Cars Sold in Indianapolis—More motor cars have been purchased by Indianapolis people this season than in any previous year, according to the records of the city controller. So far this year 1,786 licenses have been issued, the number being so great that the supply of license tags was exhausted when the 1,500 mark was reached. Last year 1,200 licenses were issued. It is estimated there are many machines in the city that are unlicensed, as the license ordinance is not strictly enforced.

Prizes for Supervisors—As an inducement to the road supervisors to put forth their best efforts in the care of the roads of New Castle county, the Delaware Automobile Association has made a proposition to the levy court, the county governing body, whereby the association offers to give prizes to the supervisors, at the rate of $15 for the best stretch of road, $10 for the next best and $5 for the next, where the roads have been improved by the use of drags. The association suggests that the court appoint one judge, the association one and the two thus selected choose the third, and that the awards be made following an inspection April 1, 1911. The court held the matter under advise-

Four Winds

ment until it could decide whether it would be wise to fix some regulations for the guidance of the supervisors in competing for the prizes.

Connecticut's Count—It is estimated after computation of the figures contained in the last registration book just issued by Matthew H. Rogers, secretary of state, that there is over $22,000,000 invested in motor cars in the state of Connecticut. According to the register there are 11,072 registered cars in the state. Dealers estimate the average purchase price $2,000 each, while the average cost of maintenance is $500.

Ohio's Big Tag Business—Ohio's state registrar of motor cars has sent out circular letters to all owners in the state to inform them that all licenses expire December 31 of this year and that new registration and a new set of number plates will be necessary in order to operate the car in 1911. The state department has opened a special shipping room, and 5,000 sets of the 1911 tags have been received. In all 40,000 have been ordered for the coming year. The 1911 tags will be on a white enamel background and the letters and figures in black.

Ford in Strenuous Climb—A feat of more than unusual importance was performed here on Sunday, October 30, when a 1911 20-horsepower four-cylinder Ford touring car, with four passengers, climbed to the summit of Mount Tamalpias, 2,800 feet in height. The only two cars that ever had made the ascension before were a Stearns and a White steamer. The Ford was driven by Harvey W. Shuman and Frank J. O'Brien, of the Standard Motor Car Co. A blanket of fog hung over the mountain, and the last mile of the climb was made on the railroad track, bumping over the ties. The road is one succession of hairpin turns and steep grades, and was exceedingly rough. No trouble whatever was experienced.

Case Helping Road Project—The lake shore drive project, by which means it is intended to connect Milwaukee with Chicago by a boulevard, thus completing the most important link in a great lake drive from the southern end of Lake Michigan to its northern extremity, is coming nearer realization. It has just been announced that the J. I. Case Threshing Machine Co., of Racine, Wis., which recently entered the motor car field by buying the Fierce Motor Co., of Racine, has begun work on a lake shore drive from Racine to Kenosha, Wis., at its own expense. The only outside assistance asked is from the town boards along the route, and they are asked simply to provide culverts for the necessary drainage. Ultimately the great lake shore drive will be a fact, the Case project insuring another link in the chain which now includes the famous Sheridan road in Chicago and the lake drive around Milwaukee bay at Milwaukee.

Gives Trophy to Barclay—The Barclay Auto Co., of Minneapolis, became the permanent possessor last week of the Tribune throphy through the decision of the trustees of the Automobile Club of Minneapolis. The Chalmers 30 had finished the three contests with the best average score as provided by the rules made in 1908.

Columbus Club Growing—During the past month about a score of new members have been added to the rolls of the Columbus Automobile Club, of Columbus, O. Applications are coming in rapidly, and it is expected to pass the 600-mark soon. The club has signed a contract for new headquarters, to be located in the Virginia hotel block at Third and Gay streets. The new quarters will be occupied after being remodeled about the first of the year.

Lajoie Gets His Number—After a considerable controversy and with much effort, State Registrar Fred H. Caley, of Ohio, has agreed to give Napoleon Lajoie, champion batter of the Cleveland baseball team, the number 384 for his Chalmers car given him as a champion batter for 1911. The fans of Cleveland organized to secure that number for him because it represents his batting average during the season. It was ascertained that the number was held by Dr. Lucien Hall, of Cleveland, who relinquished it to the noted second baseman when asked to do so.

Can Use Chains in Winter—Manager Chester I. Campbell of the Boston Automobile Dealers' Association was notified by the metropolitan park commission that as a result of the conference between representatives of the two bodies hereafter motorists would be allowed to use chains in the parkways of Boston and vicinity in the winter time. The motorists may now use chains to prevent skidding between November 15 and March 31 each year. It was thought that the time would be limited to March 15, but the commission has been more liberal.

Law Called Unconstitutional—On a test case brought by Albert Ferguson, formerly a colored driver for William M. Jillson, the circuit court at Indianapolis, Ind., has held the ordinance requiring the registration of licensing of motor car drivers and motor cycle riders unconstitutional. The finding was made by agreement with the city legal department, which admitted the measure invalid because the registration and licensing is placed in the hands of the board of public safety instead of in the hands of the mayor. About 4,000 persons have been registered. Ferguson's license was revoked for fast driving. He drove a car without a license to the police station and submitted to arrest in order to make a test case.

Plugger in New Orleans—The Regal Plugger, which has traveled more than 30,000 miles from one end of the United States to the other, arrived in New Orleans last Thursday in charge of Harry W. Anderson of Atlanta, and driven by Leo Sherrard. The car has been on the road continuously since September 15, making an all-southern tour.

Tollgates Passing—Tollgates in Maryland are slowly but surely being obliterated. The last one to go was that at Parkton, Baltimore county, a model of which was burned by Governor Crothers. The occasion was one of importance to the citizens of Parkton as well as those from other sections who have had occasion to use the toll road.

Pleasant News—The highway between Fairmount and Camillus, which has been closed the greater part of the summer, is now open, affording a splendid macadam drive all the way from Syracuse to Auburn. It has been announced that just east of Chittenango a new road on the Genesee turnpike will be opened at once, this being the natural course for tourists who are going east to take.

Milwaukee Ordinance—The Milwaukee common council is now actively engaged in revising the building code, which subject has been under discussion for more than 5 years. The garage ordinance is receiving the first attention because of the large number of these buildings now being erected and in prospect. One of the features of the ordinance is that no gasoline tank or reservoir may be placed underneath a building of more than one story in height. This section is practically the only one which has been definitely fixed in the ordinance.

Another Bay State Club—The missionary work of President Atherton D. Converse and Secretary James Fortesque, of the Massachusetts State A. A., resulted in the formation of another motor club in Massachusetts during the week, the Haverhill A. C. At a gathering of owners in that city the advantages of an organization were outlined and the men planned to interest all owners in Haverhill and its vicinity for the purpose of making the club a strong one. An election of officers will be held shortly. Great enthusiasm over good roads is reported.

Club Does Good Work—The new Syracuse, N. Y., traffic squad, which the police department has placed upon the busier corners of the business district, has won the unqualified approval of motorists. The men are distinctly on their jobs and see to it that the rights of car drivers, as well as those of horses, are observed. This was an improvement urged by the Automobile Club of Syracuse and is working out in fine shape.

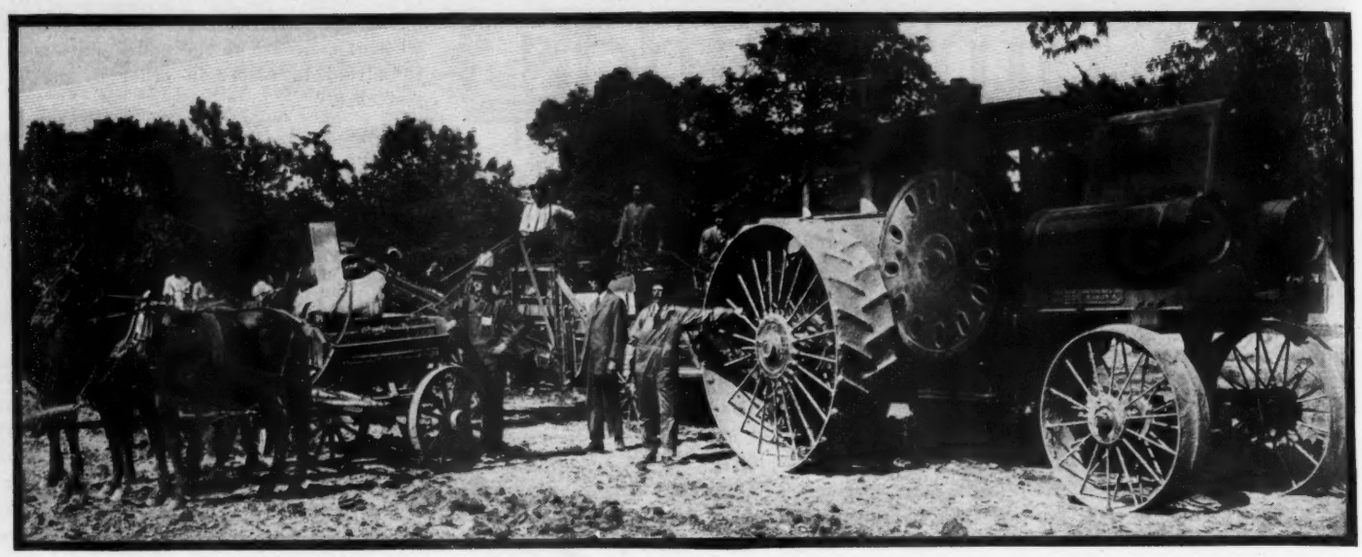


FIG. 1—ENGLISH GASOLINE TRACTOR USED IN BUILDING ROADS IN THE UNITED KINGDOM

In the Realm of the

KEROSENE OIL TRACTOR

THE OIL tractor, shown in the accompanying illustration, Fig. 3, hauling two trailers, has for its motive power a four-cylinder oil engine of 60-horsepower capacity. It was designed and constructed at Gainsborough, England, and weighs in working order somewhat over 8 tons. It hauled a trailer of pig iron weighing 6½ tons and a van with contents weighing nearly 3 tons, making the total weight hauled about 9½ tons. This oil engine tractor made a non-engine stop run of 100 miles hauling this load, the consumption of fuel being extremely low. The oil engine of this tractor has four clyinders 7 inches in diameter, the piston stroke being the same as the diameter. The engine develops 60 brake horsepower at 750 revolutions per minute and the tractor operates at speeds varying from 5 to 7 miles per hour. All the valves of the engine are arranged on one side of the cylinder and a Pickering governor is used mounted on a vertical spindle, the lubricating oil pump being driven from the lower end of the same spindle through a torsional spring. The power is transmitted to a cone clutch to a three-speed and reverse gearbox, the bevel-driven differential countershaft, being mounted in the same gearbox. The final drive is by means of two pairs of spur gears.

It is interesting to note that a winding drum is mounted in the axle, the solid axle rotating independent of the road wheel when this is brought into operation. On the dashboard of the tractor a small gasoline tank is provided for starting purposes, this vessel holding about 2 gallons, while there are two main fuel tanks arranged below the frame holding 115 gallons of oil. In connection with the gasoline chamber the oil is raised by means of a pump from the main fuel tanks and in case this pump raises the oil faster than the rate at which it is consumed in the engine cylinders the surplus fuel returns to the main tank. It is most interesting to note that the vaporizer is simply a flat chamber with corrugated services, heated by the exhaust gases, which are caused to surround it on their way to the muffler. Cold air is drawn through a large opening in the front of the radiator or casing.

THREE-WHEEL FARM TRACTOR

An accompanying illustration, Fig. 4, shows an English farm tractor of the three-wheel type hauling a harrow. The motor is of the air-cooled type, developing from 6 to 8 horsepower. The machine seen in the illustration harrowing in seed is arranged

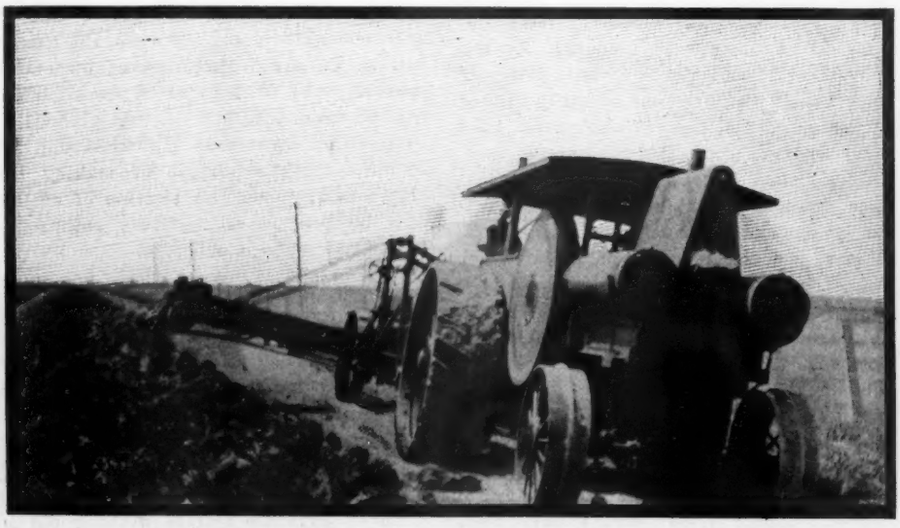
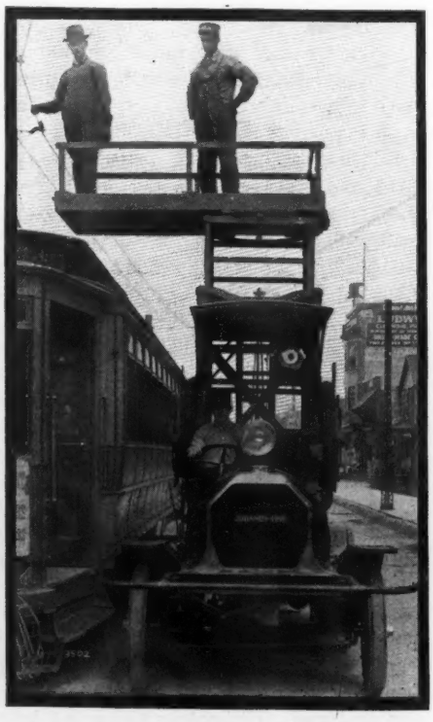


FIG. 2—ENGLISH TRACTOR ENGAGED IN ROAD WORK



JOHNSON TRUCK IN MILWAUKEE SERVICE

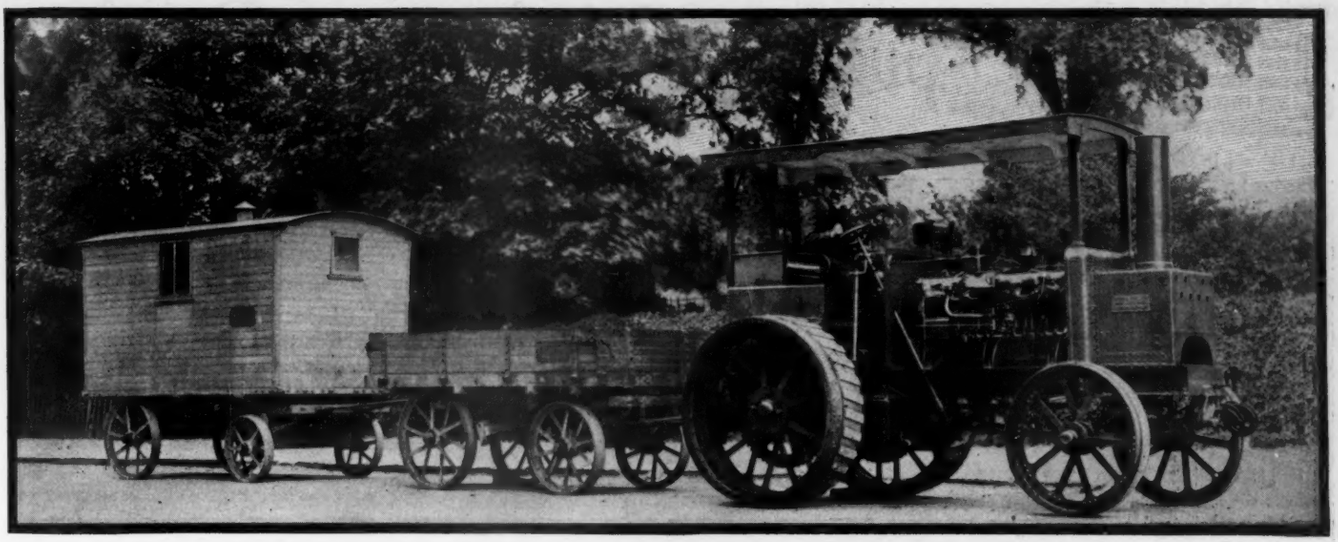


FIG. 3—GIGANTIC TRACTOR BURNING KEROSENE AND HAULING TRAILER AS USED IN ENGLAND

Commercial Car

for three speeds forward and one reverse for forward speed, being 2¼ miles, 3½ miles and 6 miles per hour, respectively. Its weight is only 2,500 pounds and it measures 108 inches in length, 61 inches in width and 60 inches in height. A unique feature of this three-wheel farm tractor is that it is provided with a removable body forming a lorry which will carry or haul up to 1½ tons. The equipment is utilized to advantage for hauling a mowing machine or for driving wheels on any surface required. The gasoline engine of the 70-horsepower tractor has a cylinder bore of 11½ inches and stroke of 17 inches. The rear drive wheels are 84 inches in diameter and have a 24-inch face, while the front wheels are 54 inches in diameter with a face 12 inches in width. The fuel tank holds 210 gallons.

TRACTOR IN ROAD CONSTRUCTION

The modern gasoline tractor is utilized to special advantage in road building, as indicated in the accompanying illustrations, Figs. 1 and 2, the former showing a 70-horsepower equipment doing street work, where a hill is being plowed down and the dirt carried by the elevator to the wagons. The man driving the team keeps along by the side of the machine until his wagon is filled and as he drives away another team takes the place of this one, and the tractor keeps moving right along loading the wagons in this manner. In Fig. 2, a large gasoline tractor is shown pulling an elevator grader utilized in road construction and it will be noted that this great labor-saving machine is automatically and continuously plowing dirt from the side of the road, throwing it into the center, thus making the road round and the center high.

In doing this road-construction work the operators guide the machine so as to plow down one side and back the other, working out towards the fence and going deeper as they plow out from the center. These gasoline tractors for road-building are of heavy construction to meet the requirements in plowing up old streets and for extreme hard work. The engine is geared to move a trifle slower than for lighter work, the shafts and axles being of large diameter and extra heavy drive wheel rims being provided, these drive wheels being drilled through to receive special cleats or lugs to hold the light machinery by belting, such as a corn grinder, hay elevator or chaff cutter, as well as a hay-press, circular saw or pump. The air-cooled engine of the single-cylinder type has a bore of 5¼ inches and a stroke of 6 inches.

JOHNSON USED AS HURRY WAGON

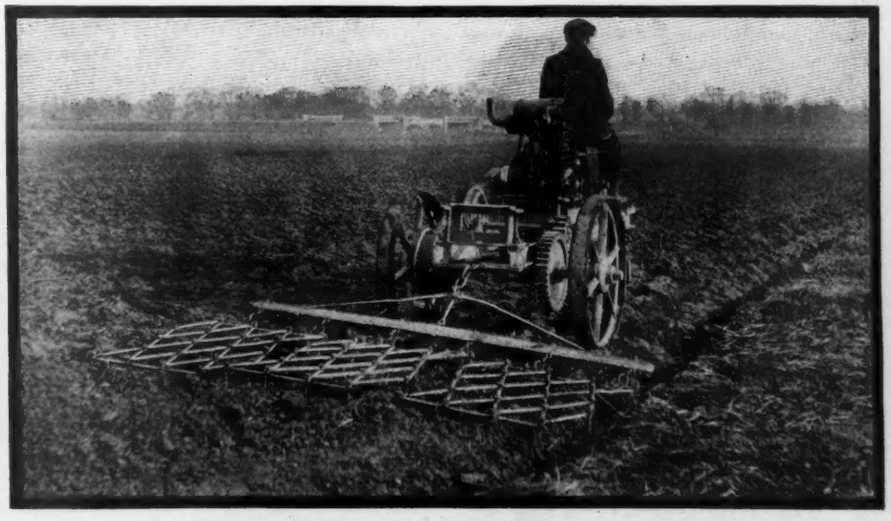


FIG. 4—ENGLISH THREE-WHEELER USED IN FARM WORK

Among the Makers and Dealers

BRONZE TABLET PRESENTED TO J. W. STODDARD BY HIS EMPLOYES

LOUISVILLE Dealers' Election—At the annual meeting of the Louisville Automobile Dealers' Association the following officers were elected: Prince Wells, president; E. G. Reimers, vice-president; Robert Levy, secretary and treasurer.

Will Show 'Em How—Henry Plow, assistant treasurer and office manager of the Mitchell-Lewis Motor Co., of Racine, Wis., has sailed for Europe. He will inaugurate the American system of accounting commensurate with the size of the business in the Paris branch of the Racine concern, which is under the management of Rene Petard, and is situated at Rue de Tilsit and Avenue MacMahon. The Paris branch superintends all continental business.

Plant for Louisville—Plans have been made to establish a large car factory near New Albany, Ind., to be known as the plant of the American Automobile Co., which makes the Jonz gasoline pleasure car. At present the concern has plants in Kansas City and St. Louis. The machinery from both of these factories will be shipped to New Albany and the entire business of manufacturing will be done there. The plant of the old New Albany Woolen Mills, now known as the Kentucky and Indiana Power Co., has been purchased by the American Automobile Co. for something like $30,000. It includes about 6 acres of ground, the greater part of which is under roof. Work of remodeling the buildings on the property will begin about November 20. The plant will employ about 700 people.

Another Clark Model—The Clark Motor Car Co., Shelbyville, Ind., has brought out an addition to its line, which it lists as model X, being similar to its model A car, except that in the model X a Waukesha motor is used in the place of the Rutenber, and 32-inch wheels instead of 34-inch are fitted.

Maxwell Plant at Auburn—The Maxwell-Briscoe Motor Co. has completed and occupied a large addition to its factory in Auburn, R. I., increasing the labor employed by more than 500 men. The additions consist of two buildings, one 370 by 85 feet, and the other 100 by 50 feet. It will enable the Maxwell company to manufacture there every part used in the cars that are built at this plant.

New Autocar Building—Another new building devoted exclusively to motor cars was thrown open Saturday in the Hub, when the Autocar Co. took possession of the six-story structure just completed for it in the Back Bay on Beacon street, near Commonwealth avenue, Boston. It is next door to the new Peerless building. The Autocar edifice is to be used principally for taking care of the commercial field of the company, which is being developed rapidly in New England. It may also be used as a service and sales department for the pleasure cars, because there is room for this, too. A full line of parts is being put in and it is proposed to make arrangements with merchants whereby they may use Autocars and the motor company will take care of and garage them at a certain cost per month, the owner simply having to send the machines out on their delivery work.

Mora Creditors Meet—Creditors of the Mora Motor Car Co., of Newark, met at Seneca Falls before Referee in Bankruptcy Charles A. Hawley. Many creditors were present and others were represented by lawyers. Three matters formed the purpose of the meeting. The first was the settlement of a reclamation suit. This was threshed out, but no method for meeting the claim could be agreed upon. The trustee had arranged a proposition for the sale of a large number of finished cars, and this was discussed, but no instruction was given the trustee either to close the transaction or to break the agreement. Still another proposition was received for the sale of the property, but the matter was not settled.

Bronze Tablet Given Stoddard—A ceremony of more than ordinary interest recently took place at the Dayton Motor Car Co. when John W. Stoddard, who recently retired as president of the concern, was surprised by the presentation of an unusually beautiful gift from the employes of the three plants included in the activities of the company, Nos. 1, 2 and 3. It was a handsome bronze tablet about 3 feet in length, beautifully designed in simple classic style, and bearing the following inscription in raised letters: "Presented October 10, 1910, to John W. Stoddard, by the factory employes of the Dayton Motor Car Co. in appreciation of his long years as a considerate employer and in recognition of those sterling qualities which have made him admired by all men."

Another Allied Interest—Announcement is made by the United States Motor Co. that the Motor Car Maintenance Co. has become affiliated with the big selling organization. The latter concern has established headquarters in the United States Motor Co.'s new building at Broadway and West Sixty-first street, New York, and will, in conjunction with the handling of Grabowsky commercial vehicles in New York, Connecticut and New Jersey, conduct a general repair business. The company will not only handle the repairs and overhauling of cars affiliated with the United States Motor Co., but will be in a position to take care of all cars regardless of their make. At a recent meeting of the organization these new officials were elected: F. D. Dorman, secretary of the United States Motor Co., president; J. D. Clay, vice-president and general superintendent; J. W. Wellington, vice-president of

the United States Motor Co., treasurer; W. R. DeVoe, of the United States Motor Co., secretary, and F. W. Darnstaedt, assistant superintendent. These, in conjunction with Vice-President Horace DeLisser, of the United States Motor Co., constitute the board of directors.

Bruce Joins United Motor—John M. Bruce, who for the past year has been general sales manager for the United Manufacturers, Inc., has become allied with the sales organization of the United States Motor Co. He will devote most of his time to the training of salesmen, agents and dealers as to the best method of selling cars affiliated with the United States Motor Co. Mr. Bruce's headquarters will be in the new building of the United States Motor Co., 7 West Sixty-first street, New York.

Crow Company Expanding—The Crow Motor Car Co., of Elkhart, Ind., is preparing to expand and expects to have greatly increased factory room in a short time. Negotiations for the purchase of the present factory building have been practically consummated and preparation for the erection of three other buildings, each 40 feet wide by 80 feet long, are already being made. It is declared that 140 men will be working in the plant before spring.

Oswald Plant Resumes—The Oswald Motor Works, of Goshen, Ind., has resumed operations. The plant has been practically idle for a month past, making changes and preparing to better care for next year's business. Mr. Oswald, who has been connected with the company since it began operation in Goshen, has withdrawn and will locate elsewhere.

Matheson Wants Receiver Discharged—The receivership of the Matheson Motor Car Co. is about to be ended. Judge Fuller, of the circuit court of Luzerne county, Pennsylvania, has been petitioned by the receivers to grant them an order to transfer the entire business to its sister company, the Matheson Automobile Co., which is increasing its capital stock to $2,650,000 in order to accomplish the purchase. Curtailed manufacturing operations have continued throughout the period of receivership, but the company will now resume active operations in its big plant at Wilkes-Barre, Pa., with full force.

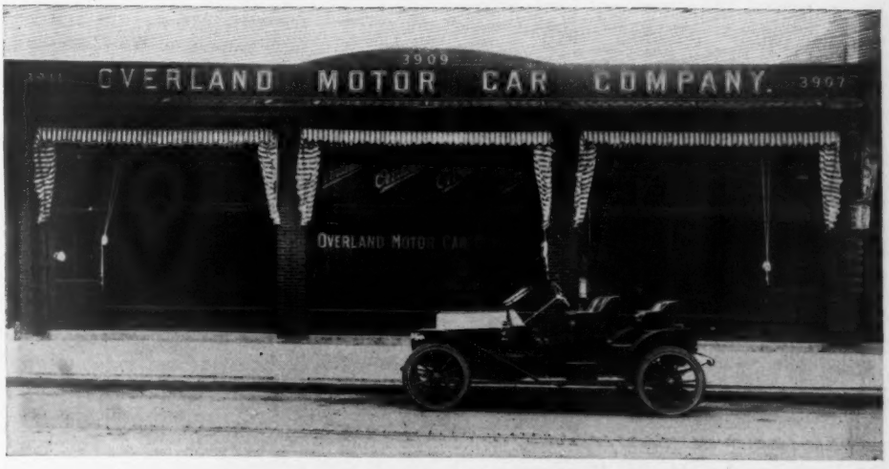
Philadelphia Fire—Tire and supply concerns suffered severely by a vicious fire last Friday which did damage variously estimated at between $500,000 and $1,000,000. The fire was discovered shortly after 6:30 o'clock by a passerby, who noticed smoke issuing from the eight-story building rented and occupied by the Hartford Rubber Works Co., at 1425 Vine street. The Hartford building was completely gutted and the loss sustained by the company is approximately $125,000. Other firms that were victims of the flames' ravages are Keystone Vulcanizing Co., occupying 1433 Vine street, with an estimated loss of $3,000; Swinehart Tire Co., 1437 Vine street, damage $1,000; Union Tire Co., 1434 Vine street, $2,000; Philadelphia Auto Radiator Co., 1424 Vine street, damaged by water to the extent of $2,000. The Hartford is temporarily located at Juniper and Cherry streets.

Death of Earl Fisher—After an illness of several months Earl Fisher died at a sanitarium in Indianapolis on November 2 at the age of 34 years. About 14 years ago he joined his brother, Carl G. Fisher, in establishing the pioneer motor car business in Indianapolis, remaining in this business 7 years. He then joined the government service and was in the Philippine islands 3 years. Returning, he became manager of the San Francisco branch of the Prest-O-Lite Co., returning to Indianapolis a few months ago because of illness.

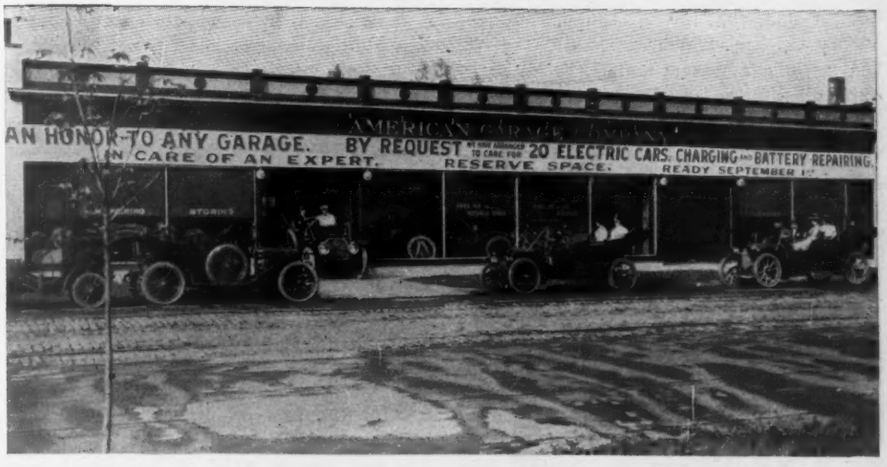
Show for New Orleans—New Orleans is assured of its first show this winter. It will be held February 24, 25, 26 and 27 at the fair grounds race track. These dates coincide with the carnival season, when the city is thronged with thousands of visitors from all over the United States. February 28 is Mardi Gras day itself. Twenty-five already have applied for space. The show will open February 24. February 25 the races will begin and will continue throughout that day and the next 2. There will be a half hour's intermission between races and the show will be open afternoons and evenings. The races will prove enough of a drawing card to pay expenses, it is believed; indeed, it is thought the show will return a profit. The small amount the dealers are paying for space will be used for advertising and decoration.

In Receiver's Hands—The Clover Leaf Machine and Axle Co., manufacturer of axles, has been thrown into the hands of a receiver on the application of Harry Keller, director of the company. John C. Paxton was appointed receiver, with a bond of $30,000, by Judge Walter A. Funk of the circuit court. Mr. Keller claims in his petition that the company has outstanding debts of $19,000 which it is unable to pay upon demand.

Avery Plant Growing—The Avery company, of Peoria, Ill., maker of the Avery truck, tractors and other agricultural machinery, has completed an addition to its plant, comprising two buildings, aggregating over 1,000 feet in length and 200 feet wide and two stories or more in height. These buildings are designed for machine shops, and new machinery is now being installed. The equipment includes several traveling cranes, which renders the handling of the heaviest truck or tractor extremely easy and rapid. The Avery plant altogether covers some 61 acres, and is one of the largest single industries in Peoria.



SALESROOM OF OVERLAND MOTOR CAR CO., ST. LOUIS


AN HONOR TO ANY GARAGE.
IN CARE OF AN EXPERT.
BY REQUEST
RESERVE SPACE.
20 ELECTRIC CARS. CHARGING AND BATTERY REPAIRING.
READY SEPTEMBER 1ST

NEW HOME OF AMERICAN GARAGE CO. IN ST. LOUIS

Brief Business

ERIE, PA.—The American Motor Sales Co. has secured the agency for the Thomas Flyer.

Racine, Wis.—The Mitchell-Lewis Motor Co. has placed practically all departments on an 8-hour work day basis.

Cleveland, O.—J. H. Kirkwood has purchased the Lake avenue garage and will sell medium-priced cars in his territory.

Washington, D. C.—The Barnard Motor Co. is remodeling the building at 1612 Fourteenth street, N. W., and will occupy it as a salesroom for the Stoddard-Dayton.

St. Louis, Mo.—The Mound City Buggy Co. has moved to its new three-story showrooms on Cass avenue and Broadway. It has taken the Halladay agency for eastern Missouri.

Boston, Mass.—Carroll Doubleday, for a long time with one of the big furniture houses in Boston, has been added to the sales force of the Boston branch of the Peerless company.

Cincinnati, O.—The Roy Thompson Automobile Co., 122 East Seventh street, distributer of the Warren-Detroit, will move to 117 East Seventh street and will open a repair shop.

Boston, Mass.—The Massachusetts Automobile Co., of Boston, has been forced into bankruptcy. The company did a big second-hand business for several years on Church street. It was not a big failure, the liabilities reaching $19,445 and the assets $3,128.

Boston, Mass.—A. N. Perry, representative of the Napier company in Boston, has leased the salesrooms formerly occupied by the Studebaker branch at 1020 Boylston street for a Napier branch. The company did all its selling and clerical work at the old plant in Jamaica Plain.

New York—C. R. Teaboldt, formerly of the E. R. Thomas New York branch, has entered business for himself under the name of C. R. Teaboldt & Co., and will control the sale of Owen and Bergdoll cars, at 1597 Broadway, and will have G. F. Aitken as secretary.

Chicago—C. P. Brewster, formerly with the Jones Speedometer Co., has opened an office at 1714 Michigan avenue. Mr. Brewster is handling the Al-Ton Motor Accessory Co. line, which consists of the Al-Ton motor car heaters and H. F. M. automatic oil filtering and lubricating system.

Toledo, O.—The LaDue Auto Top Co. has taken a lease on a portion of the building occupied by the Dosson Carriage Co. Machinery for the building of tops and accessories already has been installed. The business is under the management of Robert M. LaDue.

Minneapolis, Minn.—The following agencies have recently taken on the Wilcox truck line: Wilcox Motor Truck Co., of New England, 201 Devonshire street, Boston, Mass.; Congressional Garage Co., Washington, D. C.; George C. Brinkman, 2267 S. Kingshighway, St. Louis. This agency will go by the name of the "Wilcox Trux" Co.

Cleveland, O.—W. A. Parr has been added to the local selling force of the Goodyear Tire Co.

Boston, Mass.—Raymond Ware, who has been handling the Corbin in Boston, also has taken on the Bergdoll car.

Tacoma, Wash.—The Tacoma branch of the Ford Motor Co. is now located in new and commodious quarters at 1214 Tacoma avenue.

Washington, D. C.—The Luttrell Co., agent for the Packard, has opened new salesrooms at Connecticut avenue and Dupont circle.

Nashville, Tenn.—Work has been started on a large two-story cement garage, which will be built by the Imperial Motor Car Co. at 1518-22 Broadway. It will handle the Packard.

Minneapolis, Minn.—W. E. Roby has made known his intention of retiring from the Diamond Rubber Co.'s Minneapolis branch. The change will take effect January 1, 1911.

Washington, D. C.—The Locomobile Co. of America has opened a branch at 1124 Connecticut avenue, N. W., in the building formerly occupied by the White branch. J. E. Macdonald has been appointed manager.

Pittsburg, Pa.—The Liberty Automobile Tire and Supply Co. has secured Early Single, formerly of the H. H. Franklin Co., of Syracuse, N. Y., for its general manager. The Liberty company is manufacturers' agent for the Racine horseshoe tires and double fabric inner shoe.

Muncie, Ind.—Frank A. Hanley has recently taken over the sales and accessory business formerly conducted by the Wolf Auto Co., the style of the firm now being McInnis & Hanley, who have the Reo line for 1911. The salesroom and garage is 40 by 125 feet, of brick and steel, fireproof.

Milwaukee, Wis.—J. H. Patterson, of Chicago, has been appointed Wisconsin traveling representative for the Firestone Tire and Rubber Co., of Akron, O., to succeed J. C. Irwin. Patterson has been connected with the Chicago branch for some time. Irwin has established an agency and garage at Madison, Wis.

Boston, Mass.—The H. J. Koehler Sporting Goods Co., distributer of the Hupmobile in New York state east of Buffalo, and throughout New England, will open, on December 1, salesrooms in Boston, at 1074 Boylston street. Temporary headquarters have already been established at 17 Ipswich street, pending the completion of the new building, three floors of which will be devoted to the Hupmobile. The new branch, which is the seventh now operated by the Koehler company, is being managed by W. H. Shutt, formerly sales manager of the New York store.

Albany, Ore.—Barrett Brothers are building a new garage. They handle the Studebaker.

Cleveland, O.—R. G. Kagey, formerly with Harry S. Moore and for 2 years with the National factory in the sales department, has joined the Auto Sales Co. to sell Overland cars.

St. Louis, Mo.—The Brooks-Latta Automobile Mfg. Co. has been incorporated in St. Louis with a capital stock, fully paid, of $150,000. The concern announces it will manufacture engines and motor cars.

Washington, D. C.—The Everitt agency here has been transferred from the L. C. Ferrell Co. to the Pope Automobile Co., of Washington, which also handles the Matheson, Pope-Hartford, Oakland and Waverley electric.

Pittsburg, Pa.—Owing to the fact that J. A. Hitchcock has disposed of his interest in the Hitchcock Motor Co. to M. A. Hood, and there being other changes made in the personnel of the company, the corporate name has been changed to the Van Wye Motor Auto Co.

Toledo, O.—The capital stock of the Toledo Carbureter Co., of Toledo, O., a concern recently incorporated, has been increased from $1,000 to $75,000. The company will place on the market a new carbureter, to be made by the Kinsey Mfg. Co. Isaac Kinsey, president of the Kinsey Mfg. Co.; W. G. Nagle, president of the

Recent Incorporations

New York—Institute Motor Supply Co., capital stock $10,000; to manufacture and sell motor car, motor boat and aeroplane supplies and accessories; incorporators, Henry Perlish, James H. Whaley and Isaac A. Cary.

New York—Century Tire Co., capital stock $10,000; to manufacture and deal in tires; incorporators, Robert L. Redfield, Mortimer G. Buckley and Dean C. Molleson.

New York—Eckhoff Automobile Co., capital stock $5,000; to manufacture and deal in motor cars, accessories and supplies; incorporators, John H. Eckhoff, Jr., John H. Eckhoff and Edward J. Flanagan.

Camden, N. J.—Low Speed Turbine Co., capital stock $100,000; to manufacture motor cars, air ships, motor cycles, etc.; incorporators, J. A. MacPeak, H. L. Reese and J. H. Gaul.

Camden, N. J.—Kid-West Motor Supply Co., capital stock $100,000; to manufacture motor cars; incorporators, F. R. Hansell, W. F. Eidell and J. A. MacPeak.

Camden, N. J.—Cook's Garage and Renting Co., capital stock $25,000; to conduct garage; incorporators, J. T. Cook, G. L. T. Gibb and C. M. Cook.

Buffalo, N. Y.—Hays-Schoepflin Co., capital stock $10,000; to manufacture, store and repair motor cars; incorporators, Walter Hays, B. I. Hays and Louis G. Schoepflin.

Buffalo, N. Y.—Niger Auto Pump Co., capital stock $10,000; deal in and repair motor cars, motor boats, pumps, etc.; incorporators, Frank T. Niger, Philip H. Stern, John D. Carney and Frank L. Georger.

Buffalo, N. Y.—Mount Vernon Taxicab Co., capital stock $5,000; deal in motor cars and accessories; incorporators, Solomon Levine, Simon Levine and Louis Levine.

Announcements

W. G. Nagle Electric Co., and Frank Collins, of the National Supply Co., are the principal owners of the company.

Detroit, Mich. — The Lodewyck-Hyder Motor Co., of Detroit, has been incorporated with a capital of $15,000.

Cleveland, O.—H. P. Lawrence has obtained from A. R. Davis the agency for the E-M-F and Flanders for the territory west of the Cuyahoga river.

Hartford, Conn.—Alfred W. Peard has severed his connection with the sales department of the Carl H. Page Associates, Inc., local agent for the Chalmers.

Seattle, Wash.—W. H. Barnes, northwest distributor for the Rapid truck, has appointed the Diamond Carriage Co. of 118 Second avenue as his Spokane agent for that line.

Syracuse, N. Y.—T. F. Willis, of the Willis Motor Car Co., has opened his new Oldsmobile garage at 628 Montgomery street. There the concern will handle the Oldsmobile and the Rapid truck.

Long Island City, N. Y.—The Lozier Motor Co. has bought a plot of six lots on the southwest corner of Thompson avenue and Hulst street, where a fireproof structure will be erected, 100 by 150, six stories.

St. Louis, Mo.—Kardell Brothers, who handle the Reo and Falcar in St. Louis, have leased a garage at 4156 Olive street, which will be fitted up as a modern garage and salesroom, with a repair department. The company's main offices will remain on Main street. In addition to taking over the agency for the Gramm truck, Kardell Brothers also have become agents for the Van Dyke commercial cars.

Cincinnati, O.—The Schacht Motor Car Co. is building a new factory, 500 by 70, three stories high, being constructed of buff pressed brick.

Detroit, Mich.—William E. Lore has formed the Acme Sales Co. and started business at 237 Jefferson avenue, dealing in motor specialties.

Hartford, Conn.—D. C. Lull, who, with A. W. Church, is the Hartford agent of the Speedwell, has accepted a position as traveling missionary with the Columbia Motor Car Co.

Indianapolis, Ind.—The Peck Motor Car Co. is located in its new building, 429 North Meridian street, and will handle the Great Western and Halladay lines for the coming season.

Seattle, Wash.—W. F. McNatt has taken the agency for the Speedwell in North Yakima, Wash., and W. G. Ennis will preside over the destinies of the same line of cars in Walla Walla, Wash.

Cleveland, O.—The Empire Motor Car Co. has been organized with D. W. Reinohl as manager to sell Empire cars. The company will be located at 6506 Euclid avenue and will control Cleveland and northeastern Ohio.

Hartford, Conn.—Fred A. Law, formerly superintendent of the Electric Vehicle Co. and the Columbia Motor Car Co., has accepted a position in Imlay, Ohio, with a concern engaged in the production of commercial vehicles.

Waupun, Wis.—The Hazen building, at Main and Fond du Lac streets, has been purchased by Edward Van Loo, of Alto, Wis., who will conduct a garage and repair shop. The building has been occupied by Putnam Brothers as a garage.

Boston, Mass.—William Randall and H. G. Chisholm have been added to the salesforce of the Moon agency in Boston. Roy W. Dean has joined the wholesale staff of the E-M-F Boston Co. as one of its traveling representatives throughout New England.

Hartford, Conn.—The Buick Garage Co. has installed a taxicab service in connection with a general garage business. The firm is the local distributer of the Buick cars for Hartford and Tolland counties, and has remodeled a large building on Main street.

Hartford, Conn.—William J. Lasher of New York has assumed the management of the Hartford Chalmers branch, which is conducted by the Carl H. Page Associates, Incorporated. Harry Unwin, president of the Carl H. Page Associates, opened the local branch and as he has other interests which require his presence elsewhere, he will not make his headquarters at the local branch as in the past.

Lansing, Mich.—The Netherlander Auto Sales Co., of Detroit, has increased its capital from $5,000 to $10,000.

Milwaukee, Wis.—J. C. Irwin, Wisconsin representative of the Firestone Tire and Rubber Co., of Akron, O., has resigned.

Philadelphia, Pa.—An agency for the Cartercar has been opened here. The Johnston Motor Car Co., 326 North Broad street, has secured the agency.

Tacoma, Wash.—J. T. Keena & Co., handling the Packard, have opened Tacoma headquarters at 1127 Tacoma avenue. H. C. Berg is the local manager.

Toledo, O.—C. J. Osborne, formerly general manager of the Ohio Motor Sales Co., of Toledo, has severed his connection with that concern and accepted the managership of Ohio for the Clark Motor Co.'s line of cars.

New York—Plans have been filed to build a new coöperative garage, at 326-28 West Seventieth street, by the Independent Owners' Garage Co., to cost about $30,000. E. L. Young is president. The building will be 50 by 100.

Boston, Mass.—The Boston office of Morgan & Wright has been moved from the motor mart to 817 Boylston street. This latter place is the former home of the Hartford tires, the latter having moved into its new building a short time ago.

Hartford, Conn.—The Fisk Rubber Co., of Chicopee Falls, Mass., is about to open a branch in this city and will be ready for business in the course of the next few days. G. H. Rockwell has been assigned to the management of the new branch. A large store at 292 Asylum street has been secured.

Cincinnati, O.—H. T. Boulden, of the Franklin agency in this city, in addition to looking after his local business, has been appointed to the position of district manager for the Franklin company. Boulden will have supervision of all the Franklin agencies in southern Ohio, Indiana, Kentucky and Tennessee.

Boston, Mass.—Arrangements were completed last week whereby L. B. Butler, who has had the Rapid truck agency in Boston for several years, assumes charge of the Reliance business. The Reliance agency was opened a few months ago and has been doing pretty well. Mr. Butler will direct both from his headquarters on Harcourt street.

Portland, Ore.—Another new firm has taken headquarters in Portland. This is the northwest branch of the E-M-F Co. which has taken over the motor car department of the Studebaker Brothers Northwestern Co. and has also taken over the building and equipment at Chapman and Alder streets. L. H. Rose will have charge of the new branch.

Recent Incorporations

Buffalo, N. Y.—Cleveland Taxicab Co., capital stock $10,000; general livery; incorporators, Manning Cleveland, Fred Cleveland and Nora B. Cleveland.

Syracuse, N. Y.—Onondaga Taxicab Co., capital stock $25,000; rent motor cars, and manufacture and sell trucks; incorporators, J. J. McCarthy, J. H. Collican and R. P. Byrne.

Philadelphia, Pa.—Modern Auto Supply Co., capital stock $35,000; to manufacture and deal in motor car supplies; incorporators, Walter C. Atkinson, J. Malsby White and Henry S. Goetz.

Wilmington, Del.—International Automobile and Engine Co., capital stock $10,000,000; to manufacture airships, motor cycles and motor boats; incorporators, W. D. Arnell, Elwood H. James and S. C. Seymour.

Wilmington, Del.—Mack Motor Truck Co., capital stock $50,000; to manufacture commercial wagons; incorporators, J. J. Smith, H. C. Yarrow, G. A. Yarrow and W. K. Yarrow.

Lansing, Mich.—Aldrich Automobile Co., capital stock $5,000.

Lansing, Mich.—Automobile Brass Mfg. Co., capital stock $6,000.

Lansing, Mich.—Reo Motor Truck Co., capital stock $1,000,000; President, R. E. Olds.

Lansing, Mich.—Cumback Motor Co., capital stock $1,000; incorporators, O. R. Cumback and Arthur Bailey.

Pontiac, Mich.—Pontiac Auto and Accessories Co., manufacture motor car supplies and trimmings.

St. Louis, Mo.—Superior Motor Sales Co., capital stock $75,000; to manufacture and deal in motor cars; incorporators, M. M. Baker, O. L. Garrison, O. L. Garrison, Jr., E. Brown and G. E. Elder.

Current Motor Car Patents

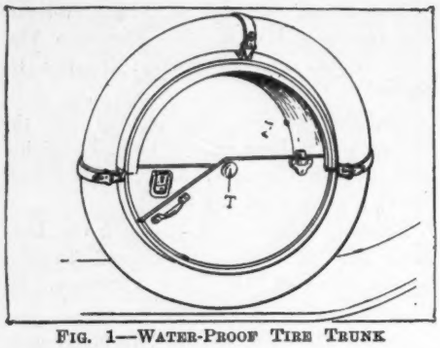


FIG. 1—WATER-PROOF TIRE TRUNK

MOTOR Car Tire Trunk—No. 973,329, dated October 18; to Samuel Wohlfeld, Philadelphia, Pa.—In the operation of motor cars, particularly such as are intended for touring, it has been found that the space enclosed by extra tires can be very well utilized for receiving a case in which sundry articles may be placed. This invention is designed to provide a tire trunk which, while involving a simple and durable construction, also provides a tight joint between the closure and the body of the trunk, so as to exclude rain or moisture and prevent the entrance of dust. The front of the trunk, as illustrated in Fig. 1, is divided diametrically into two sections, a permanent section, and a sliding section which is pivoted at the point T. By sliding this around, as indicated in the illustration access to the trunk may be readily obtained.

Oscillating Rotary Valve Motor—No. 973,800, dated October 25; to Donald J. McKinnon, Toronto, Ont., Canada—This patent applies to an internal combustion motor with rotary oscillating valves located near the head of the cylinder, as indicated in Fig. 2. The motor is of a conventional four-cycle design, except for the valve construction and the means of valve operation. The combustion chamber of the cylinders has inlet and exhaust ports in its side and the valves consist of movable sleeves adapted to open up the ports during the suction and exhaust strokes of the engine and shut them off during the compression and explosion stroke. A series of external levers and rods driven off a half-time shaft is employed to operate these valves.

Novel Internal Combustion Engine—No. 973,651, dated October 25; to Theodore H. Haberkorn, Fort Wayne, Ind.—This patent relates to an internal combustion motor in which arrangements are provided whereby ignition is obtained by means of simply super-compressing a small portion of the explosive mixture in the cylinder. The means of accomplishing this is illustrated in Fig. 4. A small plunger P is cast integral or attached to the head of the piston, a valve casing C containing an ignition chamber M is arranged in the head of the cylinder, in line with the plunger P on the piston head. When the piston nears the upper end of its compression stroke a small portion of the fuel mixture will be contained in the chamber M, so that when the plunger enters this chamber the fuel therein will be ignited by the high compression temperature to which it will be subject, so that as the top end of the stroke is reached the end of the plunger P will strike the valve V, lifting it and allowing the ignited gases to fire the main body of mixture in the combustion chamber through the holes H located at intervals around the casing C.

To Start Engine From Seat—No. 973,738, dated October 28; to Elwood G. Ellison, New York—This patent relates to a device of the character shown in Fig. 5, by means of which the motor of a car may be started from the driver's seat. It consists of a drum D, a spring S, one end of which is attached to the hub of the drum and the other to a forked member M secured to the vehicle, and a flexible connection between the drum and the handle H conveniently located near the driver's seat. In operating the contrivance, by pulling on the handle H, the drum D is revolved and the spring S wound up. When fully wound a means is provided whereby the tension of the spring may be transferred to the crankshaft, revolving it to start the motor.

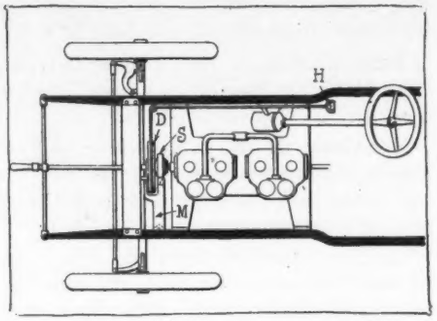


FIG. 5—STARTS ENGINE FROM SEAT

Anti-Skid Chain—No. 973,976, dated October 25; to Frederick A. Ruff, Newark, N. J.—This patent pertains to an anti-skid chain of the character shown in Fig. 3. It is not greatly unlike other chains now on the market, but differs in that the chains run alternately straight around and diagonally around the tread of the tire, and the side members do not disconnect. To fasten the chain it is slipped over the tread of the tire, after which one portion of the side links will occupy the position indicated by the dotted outline D. To secure the chain to the wheel one has but to hook the ends of the chains G into the link L.

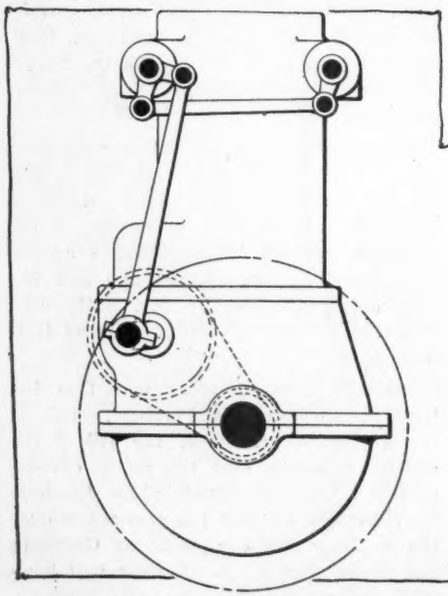


FIG. 2—OSCILLATING ROTARY VALVE MOTOR

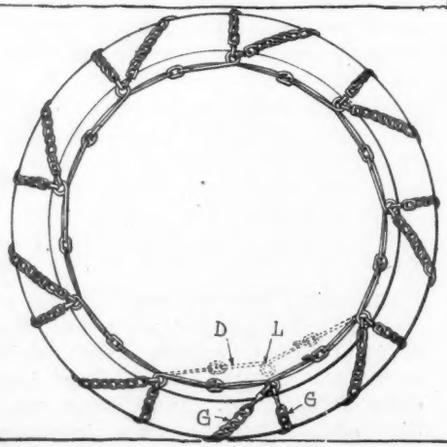


FIG. 3—ANTI-SKID CHAIN

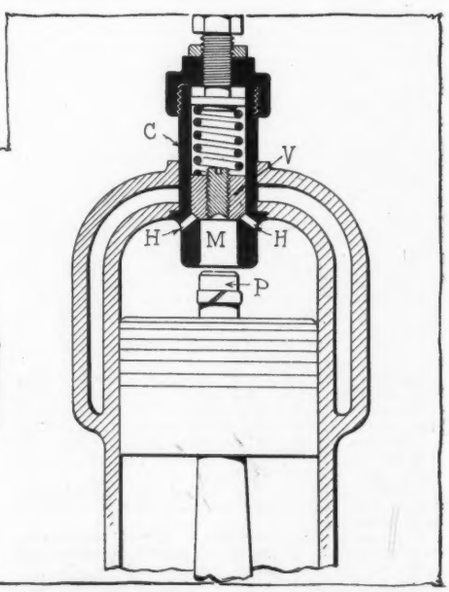


FIG. 4—SELF-IGNITING COMBUSTION ENGINE